English READING

An Introduction to
Information Technology
And
Computer Systems

By

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Chapter one

Getting started

1.1 Hardware, Software & Information Technology

Understand the basic concepts of hardware, software and information technology (IT)

Hardware

The term hardware refers to the physical components of your computer such as the system unit, mouse, keyboard, monitor, etc.

Software

The software is the instructions that makes the computer work. for instant, when we type in word via the keyboard, the software is responsible for displaying the correct letters in the correct place on the ROM, DVD or on a diskette (floppy disk) and is loaded (i.e. copied) from the disk into the computers RAM (Random Access Memory), as and when required.
The set of instructions that accomplish specific task(s) are called programs, while the elements that used as inputs are called Data which in turn become Information after being processed by these programs.

Information Technology (IT).

This is a general term that's to the use of computers as an aid to creating and maintaining data, i.e. information. IT is related to all aspects of managing and processing information, especially within a large organization. Computers are critical to managing information, and departments. Alternative phrases are IS departments (Information Services) or MIS departments (Management Information Services). People working with computers within large companies will often refer to them.

1.2 Types of computer

Understand and distinguish between main-frame computer, minicomputer, network computer, personal computer, and laptop computer in terms of capacity, speed, cost, and typical users. Understand the terms intelligent and dumb terminal.

Mainframe Computer

Mainframe computers are the gig, powerful, expensive computers used in the background by most large organizations. The power of the mainframe can be distributed among many people accessing the mainframe either via a PC or others (Work stations and Terminals).

Minicomputer

Like mainframe, these are very powerful and also expensive. In many ways, the old difference between mainframe and minicomputer have blurred in many cases. The two words are almost interchangeable. In former days, the mainframes were the biggest computers that organizations would use, the minicomputers were used mid-sized companies.

Super computer

A super computer, as the name implies is an incredible powerful with a phenomenal capacity for processing data. They are using extensively by military. In civilian use, they tend to be used for research and also in the areas such as weather forecasting where a tremendous amount of data has to be processed rapidly and used to make predictions.

More information: http//www.cray.com/

Difference Between PC And Mac

IBM invented the PC (Personal Computer) way back in 1981. all PCs released since then are in many ways compatible with the original design, though many extensions to the original design have been made. The term PC compatible relates to PCs manufactured by companies other than IBM that are compatible with traditional PC specification. (*see Fig.2-1*)

In the early days, most PCs ran an operating system called DOS (Disk operating system). These days most PCs will be running a version of Microsoft Windows (Windows 95, Windows 98, Windows Me, Windows 2000, and Windows XP).

The Apple Mac is a computer, but not a PC. It uses a different operating system, and required special versions of application programs (such as word-processors or spreadsheets). Even the hardware have to be customized to some extent to be able to be connected to a Mac. In the early days the thing that really distinguished the Mac cover the PC was GUI (Graphical User Interface), or in plain English the way you could use the mouse to drive computer. In the early days of the PC, you really had to be a bit of an expert to use and maintain your PC!
In the early days, to network PCs together was complicated task

Networked computer

A network allows you to connect two or more computers together. This allows data stored on the PC to be retrieved by other PCs connected to the network. It also allows the sharing of resources, thus instead of each PC requiring its own printer to be directly connected to it, you can have a single printer shared amongst many networked PCs. In the early days, to network PCs together was complicated task, only to be attempted by qualified professionals. These days most people with good working knowledge of Microsoft Windows can install and configure a Windows based on network. However to get best out of your network, in terms of performance and security, still requires a qualified, experienced technician. (*See Fig.3-1*)

Laptop & Palmtops computers

Laptop computers as the name implies are small, portable computers that can be run on batteries as well as mains power. They use special screens Called LCD (Liquid Crystal Display) , rather than the traditional bulky VDUs (visual Display Units) or CRT Monitor (Cathode Ray Tube) which allows for longer battery life as well as portability. A newer term indicates a very small Laptop. These are especially popular with salespersons on the move or people giving presentations. While they tend to still be more expensive than an equivalent Desktop computer, they can now match the power of a Desktop computer. Palmtops are even smaller computers. (*See Fig.4-1*)

1.3 intelligent & Dumb Terminals

Intelligent Terminal

An intelligent terminal, for example a PC, performs a lot of the processing locally i.e. within the PCs CPU (Central Processing Unit). Thus, you could use PC, linked to mainframe to extract the required information from the mainframe and then perform analysis of that data on the PC.

Dumb Terminal

A dumb terminal has very limited processing capabilities itself, but allows you to connect to a large powerful computer such as a mainframe. When you process your data from the dumb terminal, it is the mainframe at the other end of the network that has performing all the calculations. The dumb terminal only allows you to enter your data and displays the information on the screen.

1.4 Computer Speed And Capacity Issues

CPU Types

Modern PCs use some sort of Pentium (or equivalent) Central Processing Unit (CPU). There is a number of different Pentium CPUs in the market (P1, P2, P3 and P4) and to get information of the latest types read the computer press or visit the Intel Web site. Old computer may have a 586 rather than an Intel Pentium in it. This simply means that the CPU is not made by Intel, but by some other manufacturer, such as Cyrix or AMD. The Pentium name is copyrighted by Intel and only Intel CPUs can be called Pentium CPUs.

Clock Speed

The computer clock speed govern how fast the CPU will run. The higher the clock speed the faster the computer will work for you. The clock speed is given in Megahertz (MHz). The originally IBM PC ran at 4.77 MHz, whereas modern PCs will often run at over 6oo MHz which gives you an idea of how far things have progressed since the introduction of the original PC. The higher the MHz speed the faster the computer. Today, PCs with new Pentium processors have speeds of more than one or some several Gigahertz (GHz) (e.g. 1.6, 2.5, 3.3….GHz).

RAM

If you are using a Windows based on system, then you will often see great (Random Access Memory). It is the Main Memory of any PC.

Hard Disk Speed And Storage capacity

Hard disks are also measured by their speed, defined by disk access time, which is measured in milliseconds. The smaller this access time the faster the hard disk will store or retrieve data. The data storage capacity of hard disks continues to increase as new products are released. The disk storage capacity is measured in Gigabytes (GB). 1 GB is equivalent to 1024 MB. Hard Disk with 40 GB, for instance, might be partitioned to several virtual partitions or disks, starting with letter C then D, E and so forth.

1.5 Main Parts of a Personal Computer

The System Unit

The "System Unit" is the name given to the main PC box (The Case) that houses the various elements that go together to make up the PC. For instance within the system unit is the computer system's motherboard, which contains all unit also houses items such as the hard disk, the floppy disk and CD-ROM Drives…etc. system units come in two basic varieties, the tower version, as illustrated, or a desktop version, which is design to sit on your desk, and you can place your monitor on top of the system unit.

The Mother Board System

The mother board system is contained with your system unit and all the vital computer's parts plug directly into the system board. The CPU is normally housed on your system board along with all other electronic components. Other item such as the hard disk are attached to the system board, either directly or via cables. These boards are getting smaller and smaller as the components become more integrated. If you open up a system unit these days, mainly it is full of fresh air. (*See Fig.5-1*)

The CPU

The CPU (Central Processing Unit) is normally an Intel Pentium (or equivalent) and it is one of the most important components within your computer. it determines how fast your computer will run and is measured by its MHz speed or GHz. It is the CPU that performs all the calculations within the computer.

Memory (RAM)

The RAM (Random Access Memory) within your computer is where the operating system is loaded to when you switch on your computer and also where applications are copied to when you load an application, such as a word processor or database program. When you create data, (e.g. letters and picture), these are initially created and held in RAM and then copied to disk when you save the data.

ROM-BIOS

The ROM-BIOS (Read Only Memory-Basic Input Output System) chip is a special chip held on your computer's system (mother) board. It contains software that is required to make your computer work with your operating system, for instance it is responsible for copying your operating system (such as Windows) into RAM when you switch on your computer.

Serial Port

The serial port is a socket located at the back of your computer that enables you to connect items to the computer, such as a ***Modem***. They are commonly labeled as COM1 or COM2.

Parallel Port

The parallel port is a socket located at the back of your computer that enables you to connect items to the computer, such as a ***Printer***. It is commonly labeled as LPT1 or LPT2.

Universal Serial Bus (USB)

The Universal Serial Bus is a relatively new item within the PC. You will see one or more USB sockets at the back (or in front as well) of the system unit, allowing you to plug in devices designed for the USB. These devices include *Scanners* and *digital Cameras, Printers, IR, Flash disk (Memory)…etc*.
(See Fig.6-1)

The Monitor

The monitor is the TV type screen that you view your programs on. They are supplied in different sizes, common sizes range from 15 to 21 inches screens. You should be aware that poor quality or badly maintained monitors can harm your eyesight. Both *CRT* (Cathode Ray Tube) and *LCD* (Liquid Crystal Display) monitors are used now.
(*See Fig. 10-1*)

The keyboard

The keyboard allows you to type information into the computer. It has evolved over the years and many people now use a Microsoft style keyboard, which has additional keys designed to make Windows easier to use. (*see Fig. 9-1*)

The Mouse

When using an operating system, such as Microsoft Windows, you use the mouse to select drop down menus, to point and click on items, to select items and to drag and drop items from one place to another. (*see Fig. 9-1*)

CD-ROM

Most computers are now supplied with a CD-ROM (Compact Disc-Read Only Memory) drive. CD-ROM discs look exactly like music CDs but contain computer data instead of music. The advantage of a CD-ROM is that can hold a vast amount of data (equivalent to the storage capacity over 450 floppy disks). The other big advantage of CD-ROMs is that they are interchangeable. This means that you can own a range of different CD-ROMs and choose which one to insert into your CD-ROM drive. (*See Fig. 8-1*)

DVD Drives

DVD disks contains vastly more information than traditional CD-ROM disk. These also transfer the data from the disk to the computer far faster, allowing you to watch movies on your computer screen. (*See Fig. 8-1*)

A CD-ROM can store from 700 to 800 MB of data, while a single-layer, single-sided DVD can store 4.7 GB of data.

The two-sided DVD standard allows a capacity of 8.5 GB, and if double sided ups the storage capacity to 17 GB (or over 25 times the data storage capacity of a CD-ROM).

Floppy Disk

Floppy disks are also known as diskettes. They are very slow compared to hard disks or CD-ROMs, and hold relatively small amount of data (1.44 Mbytes). Sometimes people will back (i.e. copy) important data from their hard disk to floppy disk. However, as diskettes are notoriously unreliable, this not the best way of backing up valuable data (but is better than nothing). (*See Fig. 8-1*)

Hard (Fixed) Disk

Hard disks are the main, large data storage area within computer. Hard disks are used to store your operating system, your application programs (i.e. your word processor, games…etc) and your data. They are much faster than CD-ROMs and floppy disks and can also hold much more data (Mass storage). (*See Fig. 8-1*)

Flash Disk (Memory)

A portable storage device that is using the USB connection with capacity between 128MB and several GB.

Peripheral device

A peripheral device is any device that you can attach to your computer. Thus you could attach a scanner or modem to your system unit**.**

Additional Items or Cards

many extra components can easily be fitted to your computer, which has the advantage of making the computer upgradeable as newer and better hardware comes along.

Sound Cards & Speakers

many computers are now supplied with sound cards and speakers that mean that when you run “Multi-Media” programs, you can listen to sounds that are played back via your computer. If you have a microphone and suitable software, you can also record sounds. You can even purchase special software that will allow you to talk to your computer and get the computer to type the words you have spoken on your screen. In time, this type of software may replace the keyboard.

Modems

A modem is a device that is used to attach your computer to the telephone system. The modem converts data into sound that is sent over the telephone line, the receiving modem turns up the sounds back into data. If you wish to connect to the Internet, you will need a modem.

Printers

Most data is printed once you have created it and there are a vast number of different printers available to accomplish this. Most common are ink jet (or Bubble jet) and laser printer both of which can now produce colored output. In large organizations, laser printers are most commonly used because they can print very fast and give very

high quality output. Laser printers produce high quality at high speed. They are called "laser printers" due to the fact that contain a small laser within them. (*see Fig. 10-1*)

Scanners

Scanners allow you to scan printed materials into your computer, which can then be stored within the computer. These pictures can then be altered, resized and printed as required. (*see Fig. 10-1*)

Recordable CDs

CD-ROMs are read-only devices, but increasingly people are purchasing a special type of CD drive unit that allows you to record data (and music) to your own CDs. These devices require that you purchase special CDs that you can write to, called CD-R (Compact Disc Recordable).

Digital Cameras

Unlike Traditional cameras which use films to catch views, the digital cameras are using RAM or SD card to store the taken pictures digitally and transfer them directly to the computer. Pictures Resolution measured by Mega Pixels. (*see Fig. 7-1*).

Some Important Remarks

❖ **Hardware**

(a) Types of input devices:- Mouse, keyboard, scanner, light pens, joysticks, voice input for PCs, digital cameras.

(b) Types of output devices:- the VDU (Visual Display Unit) or monitors with VGA (Video Graphics Array) or SVGA (Super VGA) graphics for games, Printers, plotters, speakers.

(See Fig. 10-1)

❖ **Software**

(a) Operating System : DOS (Disk Operating System), Windows. (DOS or MS-DOS is using direct commands to tell the computer what to do, such as (COPY C:\file1.txt D:\), While Windows is using a Graphical User Interface(GUI) method, such as Mouse movements and clicks, menus, icons…etc.

(b) Application program: Word-Processing programs, databases, Excel, Graphics programs, Statistical Packages (Mini-tab, SPSS, and Stat-graph), AutoCAD, Photo shop and many others.

❖ Measuring Memory

(a) Bit:- all computers work on a binary numbering system, i.e. they process in one's or zero's. this 1 or 0 of storage is called a bit. Often hardware is specified as a 32-bit computer, which means the hardware can process 32 bits at a time.
(b) Byte:- A byte consists of eight bits
(c) Kilobyte:- A kilobyte (KB) consists of 1024 bytes.
(d) Megabyte:- A Megabyte (MB) consists of 1024 Kilobytes.
(e) Gigabyte:- A Gigabyte consists of 1024 Megabytes**.**

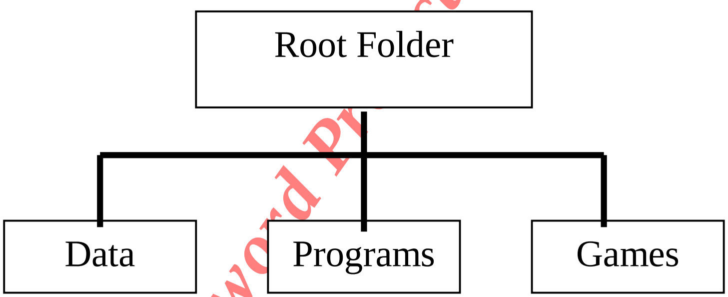
❖ **Files**:- Data and programs are stored on your disk as files. There are different types of files, such as the files that you store your data in, the files that contain your programs and also files used to store your operating system (such as Microsoft Windows).

❖ **Directories (Folders)**:- Directories or folders are used to group files together. Folders can also contain subfolders**.**

❖ **Records:-** A record is a collection of data held within a file. It is the sort of storage unit used by a database**.**

In this example, we have the root folder at the top. Below this are three

Diagrammatic representation of folders, as illustrated below



Figures of Chapter-1

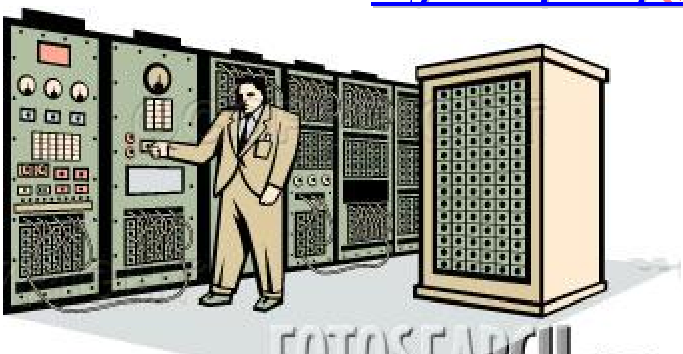


Fig.1-1: Mainframe Computer



Fig.2-1: a PC.

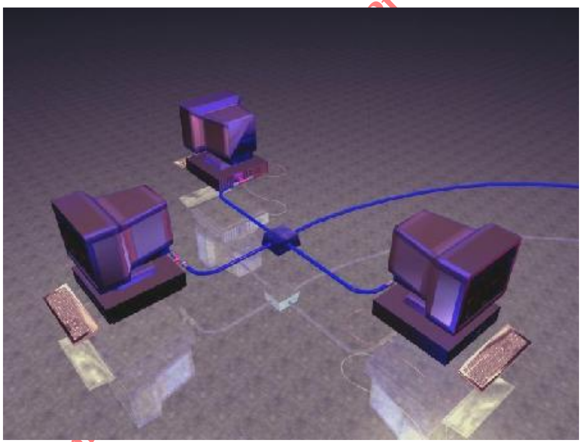


Fig.3-1: a simple Network



Fig.4-1: a Laptop computer

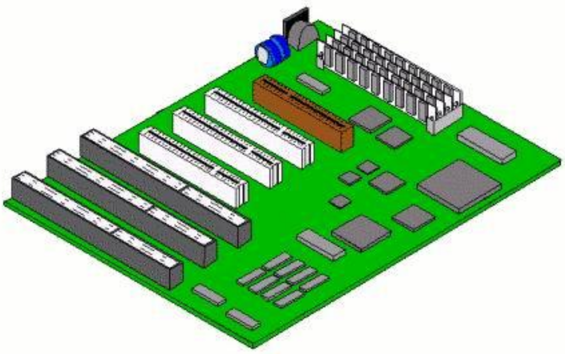


Fig.5-1: Motherboard



Fig.6-1: Digital Camera

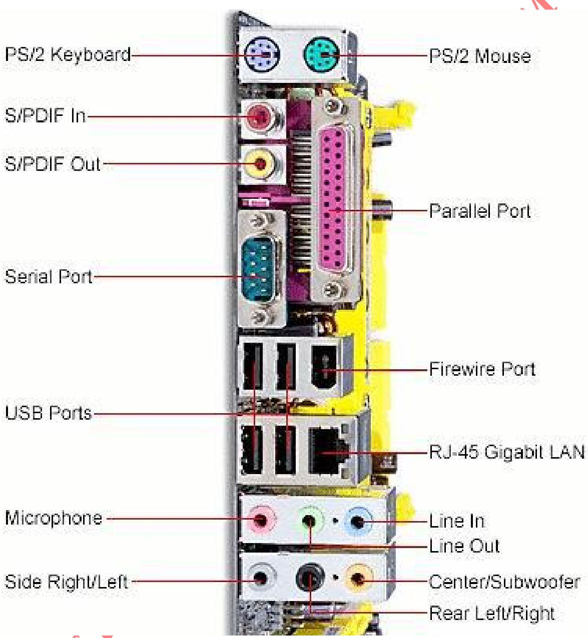


Fig. 7-1: The different I/O ports of a PC.

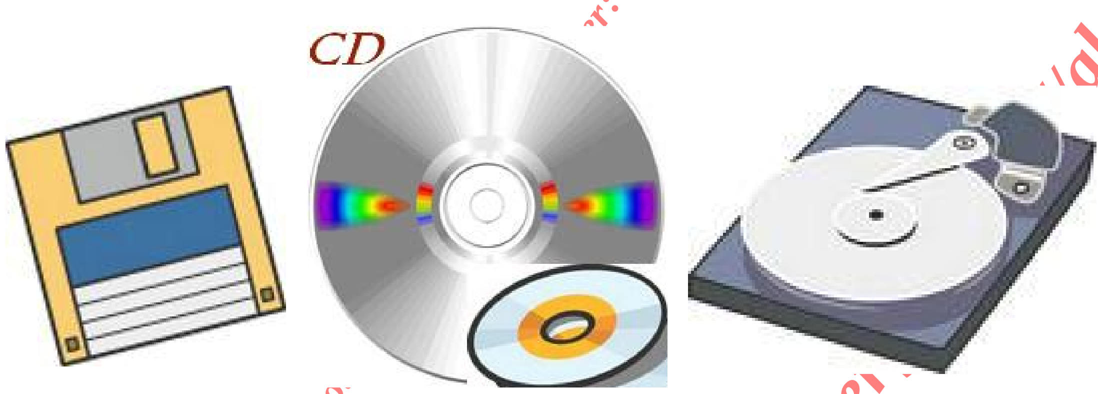


Fig. 8-1:Storage: 3.5'' Floppy Disk, CD-ROM(or DVD), Hard Disk



Fig. 9-1: Some Input Units.

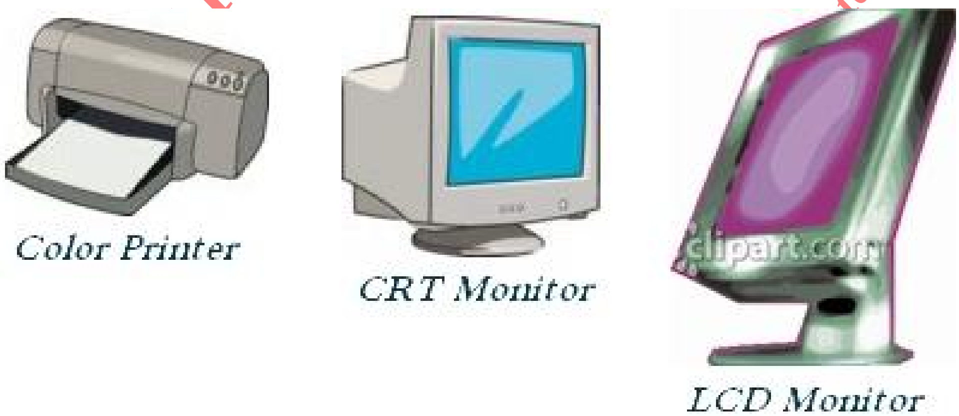


Fig. 10-1: some Output Units.

Exercises

Group 1

1- Explain the terms “hardware” and “software”.
2- What is a mainframe computer ?.
3- What is a mini-computer ?.
4- What is the difference between a PC and a Mac ?.
5- What is a network computer ?.
6- What is a laptop computer ?.
7- What is the difference between intelligent and dumb terminals ?.
8- Explain the roll of the CPU type in the overall speed of a computer.
9- Explain the role of the computer’s clock speed in the overall speed of a computer.
10- Explain the role of the amount of RAM in the overall speed of a computer.
11- What unit is commonly used to measure the storage capacity of a hard disk ?.

GROUP 2

1- What is meant by the term “system unit” ?.
2- What is meant by the term system (mother) board ?.
3- What is meant by the term CPU ?.
4- What is meant by the term RAM ?.
5- What is meant by the term ROM-BIOS ?.
6- What does the term serial port mean ?.
7- What the term parallel port mean ?.
8- What is meant by the term USB ?.
9- What does the term monitor mean ?.
10- Briefly compares and contrast floppy disks, hard disks, CD-ROMs and DVDs.
11- What is meant by the term Zip disc ?.
12- What does the tem peripheral device mean ?.
13- What is the function of a modem ?.
14- What is the function of a printer ?.
15- What is the function of a scanner ?.
16- Explain how a recordable CD may be useful.
17- What is the function of a tape backup unit ?.
18- Explain the terms “Input Device” and “Output Device”.
19- Explain the function of the CPU.
20- What unit is used to measure the speed of the CPU ?.
21- List types of Input devices.
22- List types of Output devices.
23- What is the term VDU short for ?.
24- Is the screen size normally measured horizontally or diagonally ?.
25- What is VGA short for ?.
26- List as many different types of printer as you can.

GROUP 3

1- Please complete the following table comparing the speed, capacity and cost of a range of different data storage devices.

Device	Speed	Capacity	Cost
Internal hard disk			
External hard disk			
Floppy disks (diskettes)			
CD-ROM drives			
DVD drives			

2- What is RAM short for and used for ?.
3- What is ROM short for and used for ?.
4- What does ROM-BIOS stands for and what is it used for ?.
5- What is a bit and how many bits in byte ?.
6- How many bytes are there in 1 KB ?.
7- How many are there in 1 MB ?.
8- How many bytes are there in 1 GB ?.
9- Explain the terms computer Files and computer Records.
10- What is an Operating System ?.
11- Give an examples of different operating systems.
12- What is an Application Program ?.
13- What is a Graphical User Interface ?.
14-List advantages of using a GUI.

Note: More Questions and exercises can be found on the following website:
http://www.emadit.weebly..com

Demo Version Of PDF Password Protector, Splitter and Merger: http://algologic.in
Demo Version Of PDF Password Protector, Splitter and Merger: http://algolo

Chapter two

Information Networks

2.1 LAN & WAN

Network

Connecting two or more computers together to Share the Resources (i.e. Hardware devices, Programs and Data).

LAN

A LAN (Local Area Network) is a system whereby individual PCs are connected together within a company or organization (within limited area). For instance if ten people are working together within an office it makes sense for them all to be connected. In this way, the office can have a single printer and all ten people can print to it. In a similar way, other devices such as modems or scanners can be shared. Even more useful is the ability to share information when connected to a network.

WAN

A WAN (Wide Area Network) as the name implies allows you to connect to other computers over a wider area (i.e. a Large City or the whole world) by connecting several LANs.

Workgroup Computing

The idea of a workgroup is that groups of people working together can share their resources with each other. People within the workgroup can share information on their hard disks as well as sharing printer, modems and scanners.

Many programs are also designed to be used within a workgroup. For instance when using a word –processor you may use what are called templates. For instance, your organization might want to use a standard Fax header sheet. If a template for this header sheet is held on a single computer but available to all the other computers then this has the advantage that when you need to make a change to the fax header you only have to change one file, rather than change the files on each computer.

2.2 The Telephone Network In Computing

PSDN

PSDN or Public Switched Data Network is simply the technical name for the telephone system in use today.

ISDN

Stands for “Integrated Services Digital Network”. ISDN dates back to 1984, and allows much faster transfer rates than when using modems. Using ISDN, you can transfer 64K or 124K of data per second.

Satellites

Satellite communications makes it possible for you to make a telephone call or access the internet from almost anywhere on the planet.

Fax

A Fax machine allows you to transmit printed material over the telephone system. The sending fax machine scans the page and converts the information into sound. The receiving fax converts the sound back into an image of the page for printing. Most modem computers contain a modem that is capable of sending/receiving faxes without the need for separate dedicated fax machine.

Telex

Telex is an old system used for sending typed messages via the Telex network, which has largely been replaced by the fax and email systems.

Modem

Modem takes information from your computer across the telephone system. The modem at the other end of the phone line, converts the signal back into format that can be used by the receiving computer.

Digital vs. Analogue

A digital system uses 1 or 0 to transmit data or to represent data. Thus, a digital clock will display whole seconds, whole minutes and whole hours.

An analogue system, such as a traditional clock, does not use multiples of 1 or 0, but rather uses the full range of numbers, including fraction. In this way, an analogue clock display fractions of a second.

Baud Rate

The Baud Rate tells you how fast a modem can send/receive data. Most modems have a maximum Baud Rate of 56 kilobits per second (Kb/Sec).

2.3 Electronic Mail (email)

The Benefits Of E-mail

When you send an email its transmission is often almost instantaneous. This especially useful when sending a message to someone in a different country. Also, unlike when using a telephone you do not have to worry about whether the recipient of a message, living on the other side of the world, may be a sleep. When they wake up, they can read their email and reply to you.

A single email can simultaneously be sent to many different people. This can be very useful in a business environment, however this facility can be abused and it is now possible for people to send email via the internet to million of people. This rather stupid habit is known as spamming by the internet community and is very strongly disapproved of.

This makes the Cost of E-mail very low and incomparable with the traditional mail.

What is Required To Use E-mail

To send and receive email you require a computer, plus the necessary hardware and software. There are two basic types of email that you need to know about:

i- LAN (Local Area Network), this is normally private systems that can only be accessed by people working within your organization.

ii- E-mail software to compose and send an email, but increasingly this is actually built into Windows, and many people will now compose their email within Microsoft Word and then use the Windows system to also send the email for them.

iii- Network card in your computer. In many cases, PCs. In other cases, your organization may use specialist network software such as "Novell's NetWare".

In a large company, you may often also connect to the Internet via your LAN. In other cases, you may require a modem to be connected to your computer to allow you to access the telephone system and then the Internet. In most cases the actual mechanics of connecting to the LAN and the Internet will have been setup for you by your organization's IT support staff. If you are working at home on your own or for a small company then setting up a connection to the Internet is relatively simple task.

2.4 The Internet

What is the Internet and how is it useful

The Internet is a global network of interconnected networks. The unique thing being about Internet is the sheer amount of information that you can access from it. Whatever your interest you can search for and find information on the most obscure topics.

As research tool the Internet is an incredibly valuable tool. Whether you are gathering information about a rival company on the other side of the world, or are looking for information about your family tree, you will find there is plenty of information available.

If you publish material on the Internet, it can be accessed by everyone on the Internet (providing they can find it). As a marketing tool, this has interesting possibilities. It is possible for small company to sell products and services worldwide, without the need for a single sales-person.

These days the problem is often not finding information but rather dealing with the sheer amount of information that is available. Also**,** When it comes to the Internet you have no idea how accurate or up to date a lot of the information you access really is.

Internet Search Engines

To search the Internet you use what are called Internet search engines. These are easily accessed via your Internet browser (i.e. Microsoft Internet Explorer or Netscape Navigator/communicator). Within the search engine (Such as *Yahoo!* And *Google*), You enter a word or phrase and it will retrieve documents from the Internet based on the information you type.

Cost of E-mail vs. Conventional Mail

If you are sending a traditional letter to many people, then you have to pay a fixed price for each person that you are sending the letter to. The great thing about email is that when you have the correct software you can send to one person or many people for almost the same price and that price will be a fraction of the cost of using traditional posted letters. The other great thing about email is that transmission of the email is almost instant. Whether the recipient is in the next room or on the other side of the world, if you need to telephone someone living in a different time zone then you need to consider the time at that location. If however you send an email from say, London to California, then when the recipient goes to their office the massage waiting for them

Exercises

GROUP 4

1- What does the term LAN stand for ?.
2- List some of the advantages of using a PC connected to a network.
3- What does the term WAN stand for ?.
4- Compare LANs and WANs.
5- Explain the term PSDN.
6- Explain the term ISDN.
7- Explain the term Fax.
8- Explain the term Telex.
9- Explain the term Baud rate.
10- Explain some benefits of using e-mail.
11- What is required to use e-mail ?.
12- What is the term WWW short for ?.
13- What is the Internet and how is it useful ?

Note: More Questions and exercises can be found on the following website:
http://www.emadit.weebly.com

Chapter three

IT and Society

3.1 A Changing World

- **The concept of the Information Society**

The concept of the information society refers to the fact that it is now very easy to link computers together and access information stored on other computers. The Internet is a good example. By connecting to the internet, you gain access to millions of other computers that are connected around the world. You can communicate via email with anyone on this planet (assuming they also have an email connection). Unlike posting a traditional letter, this communication via email is instant. The full impact of the information society has yet to be seen. In an age of instant worldwide communication, it is very hard for governments to maintain a grip on their population.

- **Computers and Communications**

It is clear now the strong relation between computers and communication system, which enable wide use of computer networks, mobile phones and satellite channels.

- **E-commerce**

The phrase e-commerce is a buzzword that relates to buying or selling via the Internet. Increasingly you can purchase directly via a Web site by selecting the goods or services that you require and entering your credit card details. When you send your credit card details these should be encrypted by the site operators so that no one can intercept your details. Most site that accept credit card payment are on secure services and your Internet browser program (i.e. Microsoft Internet Explorer or Netscape communicator) will normally inform you (via a pop-up) when you are entering or leaving a secure server.

.3.2 A Good Workspace

- **Your Chair**

Your chair should be fully adjustable, and be able to be moved up or down. It should have an adjustable back.

- **Your Screen**

Your screen should be fully adjustable so that your eyes are the same height as the top of the screen. You may wish to use a filter attached to the screen to reduce glare. If the screen is badly focused to bright or appears to flicker, then get a qualified technician to take look at it!

- **Your Keyboard**

Use a good keyboard and you may also wish to use a wrist pad to relieve pressure on your wrist.

- **Your Feet**

You may wish to use a footpad to rest your feet on while using the computer.

- **Your Mouse**

Use a mouse mat to make the mouse easier to use. Ensure that have space to comfortably use the mouse. If your arm or figures become tired or painful, when using the mouse, take a break and do something else.

- **Breaks**

Take frequent breaks when using a computer.

- **Other Factors**

Make sure that the area that you are using the computer in is adequately lit and well ventilated. Ventilation is especially important if you are using a laser printer, which may produce ozone when printing.

3.3 Health and Safety

- **Make sure that cables are safety secured**

You should always use the power cables that were supplied with your computer or cables of a similar quality. Make sure that cables are safety secured at the back of the desk and that you have power points located near the desk. If your desk has A cable ducting system, make sure that you use it. Avoid long trailing cables as yourself or other people can easily trip over them and cause injury to yourself or others. Apart from personal injury, accidentally pulling out power cable could cause your computer to loose power and you will loose data as a result.

Network cables tend to be delicate and easily damaged and the most common cause of failure to log onto a network server is that someone has accidentally dislodged or damaged the network cables.

- **Make sure that the power points are not overloaded**

Overloading of a power point is dangerous and a potential fire hazard! If you need more power sockets, have them properly installed by qualified electrician.

- **Repetitive Strain Injury (RSI).**

Often referred to as RSI. This is a condition caused by constant use of the keyboard or mouse. You should take a regular breaks to help avoid this type of injury. You may want to consider the use of a pad that you can rest your arms on which will help to some extent.

- **Glare from screen**

You should take a regular breaks to avoid constantly staring at the screen and straining your eyes. You should consider using the best (i.e. most expensive) monitor that you or your company can afford. .the better the monitor the better screen resolution and higher the refresh rate. For detailed work, you should also consider using large screen rather than the standard 14 or 15 screen that are common use. In many countries, your employer has a legal duty to pay for eye tests for employees as and when they request it.

- **Bad Posture**

When sitting at your computer you should have a monitor at eye level that can be adjusted to suit you. In addition, you may want to consider a footrest.

Exercises

Group 5

1. Explain the concept of the Information Society.
2. explain the problems surrounding the "Year 2000 bug" that occurred at the start of this millennium.
3. explain the term "e-commerce".
4. list some good working practices with regard to the use of computer.
5. list some bad working practices with regard to the use of computer.
6. list some of precautions that you should take to ensure that your computer is safe to use, and what does not infringe health and safety regulations..
7. what is RSI?
8. Why is it essential to use a properly designed chair when using computer.

Note: More Questions and exercises can be found on the following website:
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And
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Chapter four

Computer in everyday life

4.1 computer in the home

- ### Computer & the opportunities offered by their use

The greatest advantage in using a computer is its speed in working out repetitive calculations. For instant, lets say that you wish to work out your weekly bank balance. You could list all your expenditure in one column in a page, and list all your income in another column. You could then add up both columns and subtract the total expenditure from your total income and (hopefully) the amount left is what you have left to spend or save.

The trouble with doing this on a piece of paper is that if you suddenly remember that you have omitted an item in either list, then you will have to re-total this column and then re-do the subtraction of one column from other. This is a clear case where using a computer makes your calculation easier and quicker.

- ### Computer Games

The single biggest use of PCs within the home (along with accessing the internet) is for playing games. The capabilities of the PC have been greatly enhanced over the years and today's games bear very little resemblance to the early "Space Invader" and "Ping Pong" type games. In fact, many PC manufacturers configure PCs with games in mind.

- ### Home working

The rise of the internet and email has been accompanied with rise in lighting, heating etc compared with the small initial cost of setting up part of the workforce at home with a computer and telecom equipment, then the companies can make substantial cost saving. This also has the benefit that the people working at home can schedule work around other commitments, including looking after a family. Some research has shown that people working at home miss the "office gossip", however in a properly managed environment, this can be overcome. Additionally distance from the center of operations becomes unimportant, so that people can physically be located in areas where more traditional industry is in decline.

- **Home banking**

Traditionally banks needed branches near to population centers. However, with rise of the internet, some banks are increasingly doing away with branch system and are moving more and more services on-line. In extreme cases, banks are setting up new companies on the internet that will only deal on-line. While there are security and social implication to this change in direction there are tremendous costs savings available to the banking organizations embracing the capabilities offered by the internet.

- **Connecting to the web**

Most PCs are sold now as internet ready PCs. Often they have what is called an internet modem, which means that you simply plug a phone lines into the back of your PC. Install some software and then you are up and running, connected to the Internet! Once connected to the Net you can send and receive email, surf for information and even conduct your personal banking via the web.

4.2 Computer at Work or in Education

- **CBT (Computer Based Training)**

Computer Based Training (CBT) offers a low cost solution to training needs where you needs to train a large amount of people on single subject. These programs are normally supplied on CD-ROM and combine text, graphics and sound. Packages range from general encyclopedias right through to learning a foreign language.

- **Automated production system**

Many cars factories are almost completely automated and the cars are assembled by computer-controlled robots. This automation is becoming increasingly common throughout industry.

- **Design Systems**

Many products are designed using CAD (Computer Aided Design) programs to produce exact specifications and detailed drawings on the computer before producing models of new products. These designs may then loaded into a CAM system (Computer Aided Manufacturing) to get Automated mass production.

- **Types of systems used in business**

Computers are ideally suited to a wide range of business activities. In many cases, the of computers has results in companies shedding staff and becoming more

efficient. The flip slide is that many businesses such as banks while more efficient are also becoming more impersonal.

- **Stock Control**

Stock control is ideal for automation and in many companies, it is now completely computerized. The stock control system keeps track of the number of items in stock and can automatically order replacement items when required.

- **Accounts / Payroll**

In most large organizations, the accounts are maintained by computerized system. Due to the repetitive nature of accounts, a computer system is ideally suited to this task and accuracy is guaranteed.

- **Voice Mail / Fax**

In many companies, the traditional fax machine has been completely replaced by the ability to send and receive faxes directly from a desktop computer. This is more efficient as you do not have to waist time walking to and from the fax machine. In addition, the quality of faxes sent and received is much higher. In a similar manner, the traditional answering machine has largely been replaced by voice mail. Using this system, the message can be stored on your own computer and played back when you return to your office.

- **E-mail**

Word Processing program (such as Microsoft Word) allows you to easily produce letter, memos, etc. you can easily mail merge a list of names and addresses to produce mass mailers, individually addressed to customers or subscribers.

- **Spreadsheets**

A spreadsheet program (such as Excel) is an essential tool used by all businesses and student as well. A worksheet is an organized way to keep track of numerical data. It is used when you need to perform calculations to analyze the data. The worksheet can answer questions about data. What was the company's profit in the last quarter? Did actual revenues and expenses meet budget expectations? What was the total payroll for the week? What is the effect of different interest rates on the amount of money that can be borrowed?.

- **Databases**

A database program (such as Microsoft Access) allows to compile information and then to search this information to extract just the information you require. For instant, if you have a database of all the equipment housed within an office you can very simply produce a report listing only the equipment above a certain price.

- **Presentation**

A presentation program (such as Microsoft Power Point) allows you to produce professional looking presentations, which can be printed out directly onto slides for use with an overhead projector. Alternatively, you can display your presentations directly on a computer screen.

- **Graphics**

A graphics program (such as Corel draw) is used to produce adverts, posters and promotional material by organizations.

- **Translation Programs**

Translation programs allow you to electronically convert text from one language to another. While these programs are far from perfect, their use is becoming increasing common and they are getting better as each new version comes out.

- **Repetitive Tasks**

In the past, many repetitive jobs were performed by low skilled, poorly paid workers. Now is it more common to use computers instead.

- **Easily Automated Tasks**

The phone system is now largely automatic, while in former times all calls were made through an operator. Many other examples exist. How many can you think of?

- **Mathematical Calculations**

A computer is ideally suited to performing mathematical calculations. Before computers were widely available accountants used to work manual, paper-based spreadsheet. Within a spreadsheet, a common task would be adding up figures, and then a column of figures, and then taking the total, which is added to other column of figures. If you change one number within a column that is being summed there can be a knock-on effect on many other calculations within the spreadsheet. Re-calculating a spreadsheet could take hours (or days). On a computer, this re-calculation can take seconds.

- **Dangerous Situation**

Monitoring polluted or radioactive environments is suited to computer-based robots, where the use of a human would expose that person to unacceptable risks.

Serious space exploration is almost exclusively carried out by unmanned, computer-controlled machines. A recent exploration of Mars involved by remotely controlled from the earth, as the time taken for signal to reach Mars is just long.

4.3 Computer in Daily Life

- **Type of Systems used in the home**

Each month it seems that the computers either cost less or get more powerful!. When the original PC was released by IBM in 1981 only business could afford them. These days it is common to find powerful PCs in the home bought for educational or recreational use. It is odd to think that the computer in your home is many times more powerful than the on-board computer used to land the Apollo spaceships on the moon! Would you fly a spaceship using a home computer?

- **Accounts**

Many people now balance the monthly budget using their computer.

- **Games**

The vast majority of home computer are still used to play games on.

- **Educational**

Many parents will by their children a computer in order to take advantage of the vast range of educational software that is now available. While the price of PCs is getting lower and lower, there is the danger here that home education via the computer will be divided into the "haves" and the "have nots".

- **Working from home (Tele-working)**

If you have a computer at your home, linked to the office via modem, there is often little real need to travel to the office. Many people find that working at home is more productive, and often far less stressful than fighting your way through the computers into large city! Many stales people rarely see their head office as they communicate with their companies via phone calls or email.

- **Internet**

Many people are starting to realize that by using the Internet they can sell to the entire world. If you are not interested in making money from home the Internet offers you a vast range of educational, research and just plain fun opportunities.

- **Bank Cash Machines (hole in the wall)**

These machines, you can withdraw cash, check your balance and in some cases transfer money between accounts. This often much more convenient for customers, as they offer 24 hours service.

- **On-line Banking**

Many banks are now introducing on-line banking. Using your computer, you can connect to the banks computer system (often via Internet) and control your day to day finances from home. The concept of on-line banking has enormous benefits to the bank, they can increase their profits while reducing their investment in staff and buildings. Many customers find the advantage of paying bills and moving money between accounts, from the comfort of their own home as a very attractive idea.

- **Smart ID Cards**

These cards have recently been introduced in many countries and are called smart cards because they contain a memory chip within the card. You can spend by this card being read by special machine when you purchase goods or services and this amount is then debited from the card. When all the money on the card is spent, you need to get more virtual money credited to the card.

- **Supermarkets**

Self-scanning of goods is being introduced in many countries. When you by goods in many large shops, you are issued with a scanning device, which allows you to scan your purchases as you pick them off the shelf. When it comes to paying for your purchases you know exactly how much it has cost and also has the advantage that the check-out staff do not have to take all the products out of one basket, scan it and then re-package it in another basket. In many ways this is ideal for customer, as it offers convenience and from the shops point of view they can process orders more quickly, with less staff, and in the process increase profits.

- **On-line Supermarket**

A recent innovation is the facility to order your supermarket goods on-line and these will be delivered to your door.

- **Libraries**

Libraries use computers to log books in and out. Many libraries now use bar codes to identify individual books, when someone wishes to borrow a book the librarian scans the bar code, this tells the computer system all about the book (title, author, etc.), removing the need for this information to be keyed in. the computer system can also automatically generate reminder letters to members with overdue books.

Exercises

Group 6

1- Explain how computers within the home may be used in connection with pursuing a hobby.
2- Explain how computers within the home may be used in connection with running the household accounts.
3- Explain how computers within the home may be used in connection with working from home.
4- Explain how computers within the home may be used to help children with their homework.
5- Explain the term CBT.
6- Explain how automated production systems can increase productivity within industry.
7- Explain how computerized design systems can increase producing within the creative design business.
8- List types of computer based systems used in business to aid productivity.
9- List areas where it would be better to use a computer than a person.
10- List types of computer systems used within the home.
11- List types of computer systems used in education.
12- Explain ways in which the supermarkets have exploited the use of the computer.
13- Explain the terms "Smart Cards".

Note: More Questions and exercises can be found on the following websites:
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And
http://www.emadit.blogspot.com

Chapter five

Security, Viruses and Copyright

5.1 Security

Back Up Your Computer

The most important thing that you store on your computer is information. Often the contents of a hard disk can represent years of working. If the hard disk stops working one day you could lose all those years of work. For this reason it is vital that you take regular backups of the information that is stored on the computer. in large organizations this backup procedure is normally performed automatically by your computer support team, where the data is normally held on a centralized, networked computer.

In smaller organizations, it is often up to the individual to organize some sort of data backup. If nothing else is available. Copy your files to a floppy disk and make sure that these backup disks are stored away from the computer. If there is a fire and your office burns down, if your backup disks are stored next to the computer they too will be incinerated.

Beware Of Open Files

you should perform backups at night, if you backup your computer during the day (when you are using programs on the computer) then any program or data files that are in use at the time of the backup will not be backed up. The backup program will skip these open files.

Passwords

If your computer has a password that prevents other users from accessing it then do not give this password to any body else. Do not write the password on a card and prop this up next to the monitor and above all do not attempt to hide your access password on the underside of your desk (this is the fires place most criminals would look if trying to break into your system). Make sure you do not forget your passwords; in many cases, data cannot be recovered once the password is lost.

Shutting Down Your Computer

When you are using a Windows based on system it is important to remember that just switching off the computer or losing power due to a power cut can cause loss of data. To protect against this you should save your work regularly. Many programs have facility that automatically saves your work, say every 10 minutes (or any time interval that you specify).

Some operating systems, such as the later versions of Windows 95 and also Windows NT have a facility that will automatically detect that the computer was not properly shut down the last time it was used. If this situation is detected, then a special recovery program will be run that will attempt to fix any damage caused by power cut.

When using Windows 95 or NT, you must always use the shutdown command (located on the start menu) to close down the operating system, before switching off the power.

Electrical surge protection

The voltage that is supplied to your computer via the power cable can vary from time to time, and there are occasional power surges. Power surge protection devices are readily available and offer low price cost protection .

What To Do If The Computer Breaks Down ?

If you are working within a large organization, you should be aware that the company you are working with has a special computer support department and maintenance section, you should make sure that you know how to contact them in case of emergency.

In many smaller organizations, the situation is much less formalizes. If you are not qualified to make repairs on the computer, do not attempt to open the computer case and investigate. This is especially true of the computer monitor, inside which, are many components operating at very high voltage, which can kill . so the best way to do is to get a qualified technician to fix the problem.

5.2 Computer Viruses

What Are Computer Viruses

Viruses are small programs that hide themselves on your disks (both diskettes and your hard disk). Unless you use virus detection software the first time that you know that you have a virus. Different viruses are activated in different ways. For instance, the famous Friday the 13th virus will activate only when both a Friday and the 13th of the month. Beware, viruses can destroy all your data.

How Do Viruses Infect PCs ?

Viruses hide on a disk and when you access the disk (either a diskette or another hard disk over a network), the virus program will start and infect your computer. The worse thing about a computer virus is that they can spread from one computer to another, either via use of infected floppy disk, or over a computer network.

The Internet allows you to access files from all over the world and you should never connect to the Internet unless you have a virus-checking program Installed on your computer.

It is vital to keep your virus monitoring software up to date. Many such as Norton Anti Virus allow you to update the program so that the program can check for recently discovered viruses.

How To Prevent Virus Damage ?

There are a number of third party anti-virus products available. most of these are better than the rather rudimentary products available within DOS and Windows, but of course, you do have to pay for them. The main thing about your virus checker is that it should be kept up to date. Many companies supply updated disks on a regular basis or allow you to receive updates through an electronic, on-line bulletin board.

Anti-Virus software: are programs that are used to Detect and Remove viruses.

Passwords Protect Your Computer

You can set a power-on password on your computer. The mechanism for this will vary from one computer to another, and is determined by the makers of the computer, rather than by DOS. The advantage of a power-on password is that the computer will not boot to DOS until you supply the correct password. .This means that no one else can play around with your computer and in the process accidentally infect it with virus.

5.3 Copyright

Software Copyright Issues

Most programs that you are purchase are copyrighted and you must not copy them. If you do so you may be breaking the law and if caught, you could find yourself being prosecuted. Many people will buy a copy of a game and make a copy for their friends or other family member. This is also normally unlawful. Even lending your program disks or CD-ROM to other people may be breaking the law in most cases. There are numerous organizations, such as FAST (The Federation Against Software Theft). Which are dedicated to preventing the illegal copying of software. In a business situation, if your manager tells you to copy software, always first make sure that you have a license that entitles you to copy the software, because in many countries, you will be personally liable for damages.

What Is Freeware ?

Some software is made freely available. Demonstration disks often come under this category. In addition, a lot of software is produced by the educational community and is made freely available. Always read any licenses supplied with such software very carefully before use.

What Is Shareware ?

Shareware (some times is called Trial version) is software that is freely available and is designed to let you usethe product for free, for limited period while you decide if you like it or not after this period, you must legally either remove it, or pay an amount to the producers of the product**.**

Software On The Internet

There are some sites on the Internet run by dubious organ might make copies of commercial software freely available. If you download any software from the Internet, make sure that it is legal**.**

What Are Site Licenses?

Many large companies do not go out buy certain amount of 'Shrink-wrapped' copies of each software product that they need, instead they will buy a site license. These site licenses are different in their small print, but generally mean that the companies purchasing the license can make a fixed numbers of copies available to their staff, normally via a company network.

Exercises

GROUP 6

1- Why do you need backup your computer?
2- How might you organize your computer for more efficient backups?
3- Why is it important to use passwords to protect your computer data?
4- Describe the importance of properly shutting down your computer.
5- What a UPS?
6- Why might electrical surge protection for your computer be a good idea?
7- What are the computer viruses?
8- How do viruses infect PCs?
9- How might you protect your PC against virus threats?
10- How could you make a diskette read-only?
11- Describe some of the common software copyright issues connected with use of a PC.
12- What is freeware?
13- What is shareware?

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Chapter six

Programming and High-level Languages

6.1 Programming Language Classifications

A language is a system of communication. A **programming language** consists of all the symbols, characters, and usage rules that permit people to communicate with computers. Some programming languages are created to serve a special purpose (e.g., controlling a robot), while others are more flexible general-purpose tools that are suitable for many types of applications. However, every programming language must accept certain types of written instructions that will enable a computer system to perform a number of familiar operations. That is, every language must have instructions that fall into the following familiar categories:

1. Input/output instructions

Required to permit communication between I/O devices and the central processor, these instruction provide details on the type of input or output operation to be performed and the storage locations to be used during the operation.

2. Calculation Instruction

Instruction to permit addition, subtraction, multiplication, and division during processing are, of course, common in all programming languages.

3. Logic/Comparison Instructions

These instructions are used to transfer program control, and are needed in the selection and loop structures that are followed to prepare programs. During processing, two data items may be compared as a result of the execution of a logic instruction. As you know, program control can follow different paths depending on the outcome of a selection test (IF R > 0, THEN A, ELSE B). And a loop can be continued or terminated depending on the outcome of an exit condition test (does Q=-99.9?). In addition to the instruction in languages that the set up tests or comparison to effect the transfer of program control, there are also unconditional transfer instructions available that are not based on the outcome of comparisons.

4. **Storage/retrieval and Movement Instructions**

These instructions are used to store, retrieve, and move data during processing. Data may be copied from one storage location to another and retrieve as needed.

But even though all programming languages have an instruction set that permits these operations to be performed, there's a marked difference to be found in the symbols, characters, and syntax of machine languages, assembly languages, and high-level languages.

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6.2 Machine Languages

A computer's **machine language** consists of strings of binary numbers and is the only one the CPU directly "understands." An instruction prepared in any machine language will have at least two parts. The first part is the command or operation, and it tells the computer what function to perform. Every computer has an **operation code** or "op code" for each of its functions. The second part of the instruction is the **operand**, and it tells the computer where to find or store the data or other instructions that are to be manipulated. The number of operands in an instruction varies among computers. In a single-operand machine, the binary equivalent of "ADD 0184" could cause the value in address 0184 to be added to the value stored in a register in the arithmetic-logic unit. In a two operand machine, the binary representation for "ADD 0184 8672" could cause the value in address 8672 to be added to the number in location 0184. the single operand and format is popular in the smallest microcomputers; the two operand structure is likely to be available in most other machine.

By today's standards, early computers were intolerant. Programmers had to translate instructions directly into the machine-language form that computers understood. For example, the programmer writing the instruction to "ADD 0184" for an early IBM machine would have written:

000100000000000000000000000001011000

6.3 Assembly Language

To ease the programmer's burden, mnemonic operation codes and symbolic addresses were developed in the early 1950s. the word mnemonic (pronounced ne-monik) refers to a memory aid. One of the first steps in improving the program operation process was to substitute letter symbols for the numeric machine-language operation codes. Each computer now has a **mnemonic code**, although, of course, the actual symbols vary among makes and models. The following figure shows mnemonic codes for few commands used with some IBM mainframe computer:

Command name	Mnemonic Code	Command name	Mnemonic Code
Input /Output Commands		Compare Logical Character	CLS
Start I/O	SIO	Branch on Conditional Registrar	BCR
Halt I/O	HIO	Branch on Condition	BC
Calculation Commands		Branch on count	BCT
Add	A	**Storage/Retrieval &Movement**	
Subtract	S	Load Registrar	LR
Multiply	M	Load	L
Divide	D	Move Character	MVC
Logic/Comparison Commands		Move Numeric	MVN
Compare Registrar	CR	Store	ST
Compare	C	Store Character	STC

Machine language is still used by the computer as it processes data, but **assembly language** software first translates the specified operation code symbol into its machine-language equivalent.

And this improvement set the stage for further advances. If the computer could translate convenient symbols into basic operations, why couldn't it also perform other clerical coding functions such as assigning storage addresses to data? **Symbolic addressing** is the price of expressing an address not in items of its absolute numerical calculation, but rather in terms of symbols convenient to the programmer.

In the early stages of symbolic addressing, the programmer assigned a symbolic name and an actual address to a data item. For example, the total value of merchandise purchased during a month by a department store customer might be assigned to address 0063 by the programmer and given the symbolic name **TOTAL**. The value of merchandise return unused during the month might be assigned to address 2047 and given the symbolic name **CREDIT**. Then, for the remainder of the program, the programmer would refer to the symbolic names rather than to the address when such items were to be processed. Thus, an instruction might be written "**S CREDIT, TOTAL**" to subtract the value of returned goods from the total amount purchased to find the amount of the customer's monthly bill. The assembly language software might then translate the symbolic instruction into this machine-language string of bits:

011111	**011111111111**	**000000111111**
Mnemonic op code (S)	**2047 (CREDIT)**	**0063 (TOTAL)**

Another improvement followed. The programmer turned the task of assigning and keeping track of instruction addresses over to computer. The programmer merely told the machine the storage address number of the first program instruction, and assembly language software then automatically stored all other in sequence from that point. So if another instruction was added to the program later, it was not necessary to modify the addresses of all instructions that followed the point of instruction. Instead, the processor automatically adjusted storage locations the next time the program ran.

This assembly program, or assembler, also enables the computer to convert the programmer's assembly language instruction into its own machine code. A program of instructions written by programmer in an assembly language is called a **source program**. After this source program has been converted into machine code by an assembler, it's referred to as an **object program**. It's easier for programmers to write instructions in an assembly language than to prepare instructions in machine-language code. But two computer runs may be required before source program instruction can be used to produce the desired output.

Assembly languages have advantages over machine languages. They save time and reduce detail. Fewer errors are made, and those that are made easier to find. And assembly programs are easier for people to modify than machine language programs. But there are limitations. Coding in assembly language is still time consuming. And a big drawback of assembly languages is that they are machine oriented. That is, they are designed for specific make and model of processor being used. Programs might have to be recorded for different machine.

6.4 High-Level Languages

The earlier assembly programs produced only one machine instruction for each source program instruction. To speed up coding, assembly programs were developed that could produce a variable amount of machine language code for each source program instruction. In other words, a single **macro instruction** might produce several lines of machine-language code. For example, the programmer might write **"READ FILE"** and the translating software might then automatically provide a detailed series of previously prepared machine-language instructions which would copy a record into primary storage from the file of data being read by the input device. Thus, the programmer was relieved of the task of writing an instruction for every machine operation performed.

The development of mnemonic techniques and macro instructions led, in turn, to the development of **high-level languages** that are often oriented toward a particular class of processing problems. For example, a number of languages have been designed to process problems of scientific-mathematic nature, and other languages have appeared that emphasize file processing applications.

Unlike assembly, high-level language programs may be used with different makes of computers with modification. Thus, reprogramming expense may be greatly reduced when new equipment is acquired. Other advantages of high-level language programs are:

- They are easier to learn than assembly languages.
- They are require less time to write.
- They provide better documentation.
- They are easier to maintain.
- A programmer skilled in writing programs in such a language is not restricted to using a single type of machine.

Compiler Translation. Naturally, a source program written in high-level language must also be translated into machine-usable code. A translating program that can perform this operation is called a **compiler**. Compilers, like advanced assembly programs, may generate many lines of machine code for each source program statement. A compiling run is required before problem data can be processed. With the exception that a compiler program is substituted for an assembly program, the procedures are essentially the same as assembly language source program instructions. The production run follows the compiling run.

Interpreter Translation. An alternative to using a compiler for high-level language translation is often employed with personal computers. Instead of translating the source program and permanently saving object code produced during a compiling run for future production use, the programmer merely loads the source program into the computer along with idea to be processed. A permanently hardwired interpreter program located inside the computer then converts each source program statement into machine-language form as it's needed during the processing of the data. No object code is saved for future use.

6.5 Major High-Level Languages used in Program Coding

High level programming Languages can be categorized into two main categories:
1- Object Oriented Programming languages (OOP), which are newly in use.
2- Procedural Programming Languages (PPL), which are the old traditional ones.

Object-oriented programming (OOP) is a programming language model organized around "objects" rather than "actions" and data rather than logic. Historically, a program has been viewed as a logical procedure that takes input data, processes it, and produces output data. The programming challenge was seen as how to write the logic, not how to define the data. Object-oriented programming takes the view that what we really care about are the objects we want to manipulate rather than the logic required to manipulate them.
One of the first object-oriented computer languages was called ***Smalltalk, C++ and Java*** are the most popular object-oriented languages today. The Java programming language is designed especially for use in distributed applications on corporate networks and the Internet. (in this stage we will not expand in these languages).

Procedural Programming (PPL) is the traditional well known languages.
Early work on high-level languages began in the 1950s. **Dr. Grace M. Hopper**, for example, developed a compiler (named A-2) in 1952. Since then, many other high-level languages have been produced. Let us take a look now at a few of the most popular high-level languages:

BASIC

BASIC (Beginner's All-purpose Symbolic Instruction Code) is a popular interactive language that has wide appeal because it's easy to use. An **interactive language** permits direct communication between user and computer system during the

preparation and use of program. A problem-solver with little or no knowledge of computers or programming can learn to write **BASIC** programs at a terminal or personal computer keyboard in a short period of time. Entering data easy, and the solver need not be confused about output formats because a usable format may be automatically provide. It's also easy to insert changes and additions into a BASIC program.

Because of it's simplicity, **BASIC** was used in the first microcomputer to gain commercial success. It's now by far the most popular high-level language used in personal computer systems. This fact makes it one of the most widely installed computer languages in the world. Interpreters are frequently used in personal computer systems to translate **BASIC** instruction into machine-language code. But **BASIC** language compilers are also available for these systems. Recreational and educational programs are published in many of the personal computing magazines , and these programs are usually documented in BASIC.

BASIC was developed between 1963 and 1964 at Darmouth College under the direction of Professors John Kemedy and Thomas Kurtz. Their purpose was to produce a language that undergraduate students in all fields of study (1) would find easy to learn, and (2) would thus be encouraged to use on a regular basis. **BASIC** was a success at Dartmouth on both counts. The Dartmouth computer system used General Electric equipment, and **BASIC** was implemented on this equipment with the assistance of **GE** engineers. Recognizing the advantages of **BASIC, GE** then quickly made the language available for the use of their customers who were buying time on GE commercial timesharing systems. And Hewlett-Packard and Digital Equipment Corporation offered early versions of **BASIC** to run on their time shared computer systems.

By 1974, **BASIC** was available for most computers, and it's now offered by virtually all computer manufacturers. Although the origin **BASIC** had well –defined syntax, numerous extensions to the language were written in the decade after 1964. little thought was given to making these extensions compatible with other versions of the language. And so it is today that "**BASIC**" is really a generic name for group of dialects with many similar features. There's an American National Standards Institute **(ANSI) standard** for a minimal version of **BASIC** that was published in 1978. but this standard is so simple that it has been extended in virtually every available **BASIC** dialect. Users of **BASIC** range from public school students to aerospace engineer to business managers.

FORTRAN

We can trace the origin of **FORTRAN** (FORmula TRANslator) back to 1954 when an IBM-sponsored committee headed by John Backus began work on a scientific mathematical language. The result of this effort was **FORTRAN**, which was introduced in 1957 for the IBM 704 computer. It's estimated that the cost of producing the 25,000 lines of detailed machine instructions that went into the first **FORTRAN** compiler was $2.5 million. **FORTRAN** is noted for the ease with which it can express mathematical equations. It has been widely accepted and has been revised a number of times. Several of its features were later incorporated into the first **BASIC** language.

The vast majority of all computers now in service from small micros to the largest number-crunchers can use **FORTRAN**. Compilers rather than interpreters are used. Because of earl widespread acceptance, work began in 1962 on **FORTRAN** standard

language. Two standards – a basic or minimal version of F**ORTRAN** and a "full" or extended version – were approved by **ANSI** in 1966. **FORTRAN** thus has the distinction of being the first standardized language. The current **FORTRAN** standards were published by ANSI in 1978.

FORTRAN has the advantage of being a compact language that serves the needs of scientists, business and statisticians very well. Huge libraries of engineering and scientific programs written in **FORTRAN** are available to scientists and engineers. The language is also widely used for business applications that don't require the manipulation of extensive data files. Because there are established **FORTRAN** standards, programs written for one computer are usually easily converted for use with another. However, it may be more difficult to trace program logic in **FORTRAN** code than in some other high-level languages. And **FORTRAN** is not as well suited for processing large business files as the next language we'll, **COBOL**.

COBOL

As its name indicates, **COBOL** (Common Business Oriented Language) was designed specifically for business-type data processing. And it's now the most widely used language for large business applications. The group that designed the language gathered at the Pentagon in Washington, D.C., in may 1959, with the official sanction of the U.S. Department of Defense. Members. Members of the Conference of Data Systems languages **(CODASYL)** represented computer manufacturer, government agencies, user organizations, and universities. The **CODASYL** Short-Range Committee, which prepared the **COBOL** framework, consisted of representatives from federal government agencies and from computer manufacturers. From June to December 1959, this committee worked on the language specifications. Its final report was approved in January 1960, and the language specifications were published a few months later by the government Printing Office.

Since 1961, **COBOL** compilers have been prepared for virtually all processors used in business data processing. And they are available now for use with small personal computers. Other **CODASYL** committees have continued to maintain, revise, and extend the initial specifications. An **ANSI COBOL** standard was first published in 1968, and a later version was approved in 1974. a new standard is scheduled to appear in the 1080s. one advantage of **COBOL** is that it can be written in a quasi-English form that may employ commonly used business terms. Because of this fact, the logic of **COBOL** programs may be often be followed more easily by the nonprogrammers in business. Thus, there may be less documentation required for **COBOL** programs. **COBOL** is better able to manipulate alphabetic characters than FORTRAN, and this is important in business processing where names, addresses, or descriptions are frequently reproduced. Also , a standard version exists; the language is relatively machine-independent; and it's maintained, updated, and supported by its users. Finally, there are large libraries of **COBOL** business applications modules and packages available today from vendors. To give just one example, Raytheon's Ready Code system offers customers a library of reusable modules and logic structures that can significantly reduce the time required to code and test new **COBOL** programs. A limitation of **COBOL**, however, is that it's obviously not a compact language. It's not the easiest high-level language for most of us to learn, and it's not as well suited for complex mathematical computations as **FORTRAN**.

PL/1

We've seen that early languages such as **FORTRAN** and **COBOL** were written to solve either scientific or business data processing problems. But in early 1960s, IBM and a committee of users of the **IBM** system/360 family of computers began development work on what was promoted as a "universal language." This PL/1 language (Programming Language/"one") was implemented in the mid-1960s to solve all types of business and scientific problems. As a scientific language, PL/1 was designed to include some of the features of **FORTRAN**; however, **COBOL**-type file processing techniques are also used. An **ANSI** committee produced a PL/1 standard in 1976. A "Subset G" of this full standard is also available for use with personal computers.

RPG

RPG (Report Program Generator) was introduced in the 1960s as a language that could readily duplicate the processing approach used with punched card equipment. Its use is still limited primarily to business applications processed on small business computers. As the name suggests, **RPG** is designed to generate the output reports resulting from the processing of such common business applications as accounts receivable and accounts payable. But **RPG** can also be used to periodically update accounts receivable and accounts payable files.

ALGOL

ALGOL (ALGOrithmic Language) was introduced in 1958. it was designed by an international group of mathematicians, and developed by group in Europe and the United States. John Backus of **FORTRAN** fame assisted in this development. As you might expect, **ALGOL** was intended for the use of those involved scientific and mathematical projects. Several versions of the language have been created, and the current version is **ALGOL 68**. **FORTRAN** has generally been used instead of **ALGOL** in the United States, but **ALGOL** is very popular in Europe like **PL/1, ALGOL** is a block-structured or modular language that's well suited for use in a structured programming setting.

Pascal

An offspring of **ALGOL** is **Pascal**. Named in honor of Blaise Pascal, a seventeenth-century French mathematician, philosopher, and inventor, this language was developed in the late 1960s and early 1970s by Professor Nicklaus Wirth at Switzerland's Federal Institute of Technology. **Pascal** was the first major language to be created after the concepts associated with structured programming became widely disseminated.

Pascal can be used for both scientific and file processing applications. a growing number of instructors are using it to teach programming to their computer science majors. And Pascal is now one of the major languages running on mini- and microcomputer systems. Professor Kenneth Bowles of the University of California at San Diego has pioneered the use of Pascal on small machine.

Ada

Another language in the **ALGOL/Pascal** lineage is **Ada**. This language is named in honor of Lord Byron's daughter Ada Augusta, the Countess of Lovelace. Ada worked with Charles Babbage on the concepts for an "Analytical Engine" in England during the first half of the nineteenth century. Because of her writing, she is considered by many to be the first programmer.

The **Ada** language is sponsored by the U.S. Department of Defense (DOD) for use by the military services. In 1975, the DOD began a series of studies for the purpose of specifying and designing a new common language to be used by computer vendors and military programmers. The new language **Ada** was presented by the design team late in 1980. critics called it unwieldy inefficient, while supporters labeled it a breakthrough in software technology. It's still too early to know which view will prevail. Since the DOD will require military computers to have **Ada** capability, however, the language will endure. And announcements of powerful microcomputer chips supported by an **Ada compiler** have been made by Intel corporation.

APL (A Programming Language**)** is a powerful interpreted language that's used with personal computers and larger system. It uses many curious symbols such as squashed squares and bent arrows. But it can often perform complex arithmetic/logic operations with a single command.
APT (Automatically Programmed Tooling**)** is used in manufacturing applications to control machine tools
C was developed at Bell Laboratories and was used to produce the Unix operating system. It is a favorite of systems programmers and others who develop software packages for small computer systems. It is also used to create graphics and special effects in films **(**e.g. Star Trek and return the Jedi**)**. Code that approaches machine language in density and efficiency may be written, but c also offers some high-level language features.
FORTH, like C, resembles a high-level assembly language. It's used by systems programmers for in-hours software development projects. It's also used to control astronomical telescope in observatories around the world.
Fourth-Generation Language is a term that's often applied to the sophisticated software packages that permit end-users to query data bases and extract the information needed to solve problems and prepare reports. These application generators allow people to specify the result desired., but users don't have to outline the approach required to achieve the results.
LISP (LISt Processing Language**)** was developed by John McCarthy in 1959-1960 to support research in the field of artificial intelligence (AI). It's designed to manipulate nonnumeric data, and has remained the language of choice among AI Researchers in the United States.
Logo with developed as an offshoot of LISP and has been popularized by Seymour Papert and others as a first instructional language for children. Although it's used in universities for serious scientific work, young children are able to write Logo programs in a short period of time. For example, they can use an on-screen "turtle" create drawing and animated cartoons.
Modula-2 is a new language developed by Nicholas Wirth, the creator **Pascal**. Although it retains the advantages of Pascal. **Modula-2** is expected to be more powerful and easier to use. It's relatively easy to translate Pascal programs into **Modula-2 code**.
PILOT (Programmed Inquiry Learning Or Teaching**)** is used by the developers of computer-assisted instruction materials to prepare programs that emphasize drills, tests, and dialogs.
PROLOG is relatively new AI language that has been chosen by the Japanese to be standard language for their "fifth-generation" computer project.
SNOBOL (StriNg Oriented SymBOlic**)** is a text-manipulating and information retrieval language used by researchers in the humanities.

Figure 6.2. A summary of additional major programming languages,

6.6 Program Implementation & Maintenance

1- Program Implementation

The first step in program implementation if to debug the program, i.e. to detect and correct errors that prevent the program from running. Testing the results produced by the program to see if they are correct is the next implementation step. And ensuring that a complete documentation package is available for the application is a third implementation step.

Debugging : bugs are the clerical mistakes and errors that crop up in programs these bugs or "glitches" **(**bugs have also been defined as "sons of glitches"**)** just seem to occur even under the best of circumstances and even when matters are not being helped along by our natural human tendency to screw things up. It's unusual for complex programs to run to completion on the first attempt. In fact, the time spent in **debugging** and testing often equals or exceeds the time spent in program coding. Failure to provide for possible program path, keying errors, mistakes in coding punctuation, transposed characters, these are but a few of the bugs that can thwart the programmer.

To reduce the number of clerical and logical errors, the programmer should carefully check the coding for accuracy prior to its entry into the computer. This **desk-checking** process should include an examination of program logic and program completeness. Furthermore, typical input data should be manually traced through the program processing paths to identify possible errors. In short, the programmer attempts to play the role of the computer.

After programs have been desk-checked for accuracy, an attempt is made to convert the source program into object-program form. Compiler programs interpreter co0ntain error-diagnostic features, which detect (and print messages about) mistakes caused by the incorrect application of the language used to prepare the source program. In many organizations, a programmer can sit at a workstation and key in the program code from his or her coding sheets. The programmer can then call up online compiler program to immediately convert the source code into object code. Next, a listing of the detected language-usage (or **syntax errors**) may be displayed on the screen of the workstation. The programmer may interact with program development software and use the editing features of the workstation to correct detected errors. When changes have been made in response to detected errors, a new compilation can be ordered. This process may continue all detected syntax errors have been remedied.

You should realize, however, the compiler/interpreter diagnostic checks will not detect the presence of **logic errors** in program. If an instruction should be "LET A = B*C" but has been coded "LET A B + C," this error will not be noticed since no language rules have been broken. Thus, an "errorless" pass of the program through the compiler or interpreter does not mean that the program is perfected or that all bugs have been eliminated. But it usually does mean that the program is ready for testing.

Testing: A program to be tested has generally demonstrated that it will run and produce results. The purpose of **testing** is to determine whether the results are correct. The testing procedure involves using the program to process input test data that will produce known results. The items developed for testing should include:

- Typical data, which will test the generally used program paths.
- Unusual but valid data, which will test the program paths used to handle exceptions.
- Incorrect, incomplete, or inappropriate data which will test the program error-handling capabilities.

A testing procedure that's often followed to separately test different portions of program. This helps to isolate detected errors to a particular program segment. The use of a modular programming approach, of course, eases this procedure. Another technique that's often used is to entrust much of the twisting to someone other than the programmer who wrote the code. A fresh outlook is often helpful, and errors that are missed by a programmer who is too familiar with code may be easily picked up by someone else. There are also many specialized software packages available today that are designed to help people test applications programs. For example, Softool's instrumental packages may be used to test **COBOL** programs, and Boole & Babbage's XPF is used for online, interactive testing.

If the program passes the tests, it may released for use. It should be noted here, however, that errors may still remains. In complex programs there may be tens of thousands of different possible paths through the program. It simply isn't practical (and maybe not even possible) to trace through all these paths during testing. For example, the flowchart in figure 6.3 looks rather simple, but the number of different possible paths is an astounding 10^{20}. if we could somehow check out one path per nanosecond, and we had started our testing in the year 1, we would only be about half done today! This is why programs may suddenly produce nonsense months after they've been released for use. Some unique and unanticipated series of events has produced input or circumstances that turn up an error for the first time. The error was always there; it simply remained undetected. It's thus impossible to certify that very complex systems are error-free.

Documentation: Documentation, as we have seen, is the process of collecting, organizing, storing, and otherwise maintaining on paper (or on some relatively permanent medium) a complete record of why applications were developed, for whom, what function they perform, and how these functions are carried out. Producing documentation is an important, but then neglected, activity of programmers. A number of special of programs are available to help people carry out this function. (Softool's DOCUMENTER A, and CGA/Allen's BCD II are just two examples of these documentation tools.)

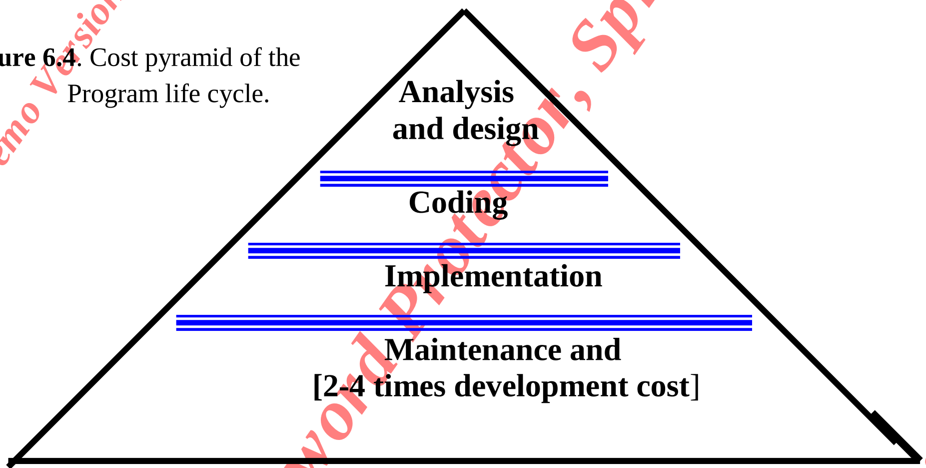
The documentation package for a program used in an organization should include:

1. **A definition of the problem**. Why was the program prepared? What were the objectives? Who requested the program and who approved it?
2. **A description of the system**. The system or subsystem environment in which the program functions should be described (systems flowcharts should be included). Broad systems specifications outlining the scope of the problem, the form and the type of input data required should be clearly stated.

3. **A description of the program.** Program flowcharts, program listings, test data and test results, and other documents that describe the program and give a historical record of difficulties and/or changes should be available.
4. **A recitation of operating instruction.** Among the items covered should be computer switch settings, loading and unloading procedures, and starting, running, and terminating procedures.
5. **A description of program control.** Controls may be incorporated in a program in a number of ways. For example, programmed controls may be used to check on the reasonableness and propriety of input data. A description of such controls should be a part of the documentation.

Program Maintenance: Changing business conditions, the revised needs of personal computer users, new laws, these and other factors require that production programs be continually maintained and modified. **Program maintenance** is an important duty of programmers and may involve all steps from problem definition through analysis, design, and program preparation. In some installations there are programmers who do nothing but maintain production programs. It generally takes less time for these programmers to make a change than it does to find the program location(s) where changes are needed.

Figure 6.4. Cost pyramid of the Program life cycle.



When an organization first acquires a computer, much of the programming efforts goes into the development of new applications. But as the number of installed programs in the organization grows, it's not unusual to find that more programming time is being spent on maintenance than new development work. In fact, in many organizations well over half the total programming effort is spent on maintenance. And it's estimated that over the life cycle of a typical application, the maintenance and enhancement costs that are incurred may be two or four times larger than the initial development costs (see figure 6.4). to reduce maintenance costs and improve programmer productivity, many organizations have invested in software packages that can automatically go through programs and identify poorly written or unnecessary lines of code. (Catalyst Corporation's Structured Retrofit, and SAGE Software's Maintenance Programming System are examples.)

Exercises

Group 7

1. Every programming language has instructions that fall into four categories. Identify and discuss these categories
2. An instruction prepared in any machine language has at least two parts. Identify these parts and discuss the function of each.
3. (a) How does an assembly language differ from an machine language (b) how is an assembly language source program translated into a machine-language object program?
4. (a) What advantage do high-level language have over assembly language? Discuss two approaches used to translate high –level languages into machine languages.
5. (a) What is **BASIC**? (B) where did it originate? (c) how it is used today?
6. (a) What **is FORTRAN**? (b) How did it originate? (c) How is it used today?
7. (a) What is **COBOL**? (b) How did it originate? (c) How is it used today?
8. (a) What is **PL/1**? What advantages does it possess?
9. (a)What is **RPG**? (a) How is it used? (c) Why is it a limited-purpose language?
10. Discuss the development and current use of (a) **ALGOL**, (b) **Pascal**, and (c) **Ada.**
11. What questions should be considered in determining the programming language to use in given situations?
12. What step can be taken during debugging and testing to locate and remove program errors?
13. What should be included in a program documentation package?
14. Why is program maintenance needed?
15. Fill in the cross puzzle form presented below.



Across: 1) Working device 2) Programming language 5) /1 7) Information 9) Examine 10) Operation code 13) ----reviews 15) Programming language 18) Accumulator 21) Accumulator 22) Set of programs 23) Preserved.

Down: 1) Standard or unit measurement 3) A fully compiled or assembled program that's ready to be loaded into the program. 4) An organization that develops and approves standards in many fields. 6) Method of computer programming in which each step of the solution to a problem is contained in a separate subprogram.
8) Programming language 9) Keep track 11)Programming language
12) Programming language 14) Programming language 16) Programming language 17) Self-esteem 19) Clerical mistake 20) RPG is a language that uses built ----- processing logic.

Chapter seven

Management Information System (MIS)

3-1 Management Information Concept

As long as an important resource is supplied to us when and where we need it, in the right quantity and quality, and at a reasonable cost, we tend to take it for granted. It's only the cost increases and/or the supply and quality of the resource seems to deteriorate that we organize its importance, so it has been with management information. Previously acceptable information systems have seemed to deteriorate in recent year. In simpler times, many of the systems that have been discarded in the last decade were considered models of efficiency. But times are not simple today for managers. The growing size of many organizations, and the speed with which new technological discoveries are now being applied for competitive purposes combine to produce a complex and challenging management environment.

At the beginning of this century, for example, there was an average wait of 33 years between invention and its application. But the laser was invented in 1953 and was being used just 7 years later for manufacturing and surgical purposes. And as this application rate continues to accelerate, less reaction time is available to manager. Thus, as pressures increase from domestic and foreign competitors, managers have found that previously acceptable systems are no longer adequate to meat their information needs.

3-2 Information Needs of Managers

What information does manager need to manager effectively!? A common need basic to all manager is an understanding of the purpose of the organization, i.e., its policies, its programs, its plans, and its goals. But beyond these basic informational requirements, the question of what information is needed can be answered only in broad general terms because individual managers differ in the ways in which they view information, in their analytical approaches to using it, and in their conceptual organization of relevant facts.

An additional factor that complicates the subject of the information needed by managers is the organizational level of the managerial job. In the smallest organization, there are few managerial levels, and the managers tend to be generalists. That is, they are knowledgeable about most (if not all) of the group's activities, but as organization grow in size, people with specialized knowledge are hired and additional managerial levels are created. Information that's satisfactory for generalists (who can often use their overall knowledge to fill in the missing gaps) is often not acceptable when supplied to specialists. It thus becomes necessary to supply different type of information to people at different levels.

Top-level managers still must have a general understanding of the organization's activities. Since they are charged with weighing risks and making major policy decisions on such matters as new product development, new plant authorizations, and so on, they need the type of information that will support these long-range **strategic plans and decisions.** Middle-level managers are responsible for making the **tactical decisions** that will allocate the resources and establish the controls needed to implement the top-level plans. And lower-level managers make the day-to-day **operational decisions** to schedule and control specific tasks. The actual results of an operation may be checked daily against planned expectations, corrective actions may be taking as needed. In short, managers use their time differently, needed internal information with varying degrees of detail, and need different mixes of internal and external information in order to make their decisions.

3.3 Properties of Useful Management Information

As general rule, the more information serves to reduce the element of uncertainty in the decisions made by manager at all levels, the greater is its value. But like other basic resources available to manager, information is usually not free. The cost acquiring must usually be compared with benefits to be obtained from its use. Just as it's economically foolish to spend $100 to mine $75 worth of coal, so, too, is it unsound to produce information costing $100 if this information doesn't lead to action that yield a greater return. Generally speaking, information that possesses the properties of accuracy, timeless, completeness, and conciseness will be more available than information lacking one or more of these characteristics. However, compromises are often made in one or more of these properties for economic reasons.

I Accuracy:- is the ratio of correct information to the total amount of information produced over a period. If 1,000 items of information are produced and 950 of these items give correct report of the actual situation, then the accuracy level .95. whether this level is high enough depends on the information being produced Fifty incorrect bank balances in a mailing of 1,000 bank statements are intolerable. But if physical inventory records kept on large quantities of expensive parts achieve an accuracy level o.95, this might be acceptable. In the case of bank statements, greater accuracy must be obtained. In case of the parts bank inventory, greater accuracy could be achieved, but the additional costs required to gather it.

II Timeless:- Timeless is another important information characteristic. It's of little consolation to a manager to know that the information that arrived too late to be of use was accurate. Accuracy alone is not enough. How fast must be the response time of the information system? Unfortunately, it's once again impossible to give an answer which will satisfy all the information. In case regular report, an immediate response time following each transaction would involve a steady outpouring of documents. The result would be a costly avalanche of paper that would bury managers. Thus, a compromise is often required. The response time should be short enough so that the information does not lose its freshness and value, but it should be long enough to reduce volume (and cost) and reveal important trends that signal the need for action. Of course, when instant access to "time critical" information is needed, quick-response online system must be used.

III Completeness:- Most manager faced with a decision to make have been frustrated at some time by having supporting information that's accurate, timely and incomplete. An example of the consequences of failure to consolidate related pieces of information occurred at Pearl Harbor in 1948. Historians tell us that data available, in bits and pieces and scattered points, if integrated, would have signaled the danger of Japanese attack. Butter integration of the facts available at scattered points in a business for the purpose of furnishing managers with more complete information is a goal of information system designers.

IV Conciseness:- Many traditional information systems have been designed on the assumption that lack of completeness is the most critical problem facing manager. This assumption has often led designer to employ an effective shotgun approach, peppering manager with more information than can possibly use. Important information, along with relatively useless data, is often buried in stacks of detailed reports. Managers are faced with problem of extracting those items of information that they need. **Concise information** that summarizes the relevant data and points out areas of exception to normal or planned activities is what is often needed by-but less often supplied to-today's managers.

3.4 An MIS Orientation

In the late 1960s and early 1970s, many managers began to realize that they were't able to cope with rapidly changing conditions merely by using the routine reports that their traditional systems were producing. There information didn't possess properties mentioned above, and it was no longer adequate to meet their need. Responding to these management needs, system designers began to develop new computer oriented management information systems that were more responsive and more comprehensive than those that had existed just few years earlier. There was initially talk of designing a completely integrated "total system" built around a single online data base that would instantly give managers all the information they needed to make their decisions. As you might expect, this proved to be an unrealistic goal that failed to recognize the complexities of operating modern organization. Few, if any, total system designs were actually attempted. Instead, the system designers in an organization developed a long-range conceptual model of management information system for their organization and then gradually began to integrate the existing information-producing systems in the organization into their long-range plan. This integration continues today.

The formidable task of the MIS designer is to develop the information flow.

8.5 The management information system (MIS)

Concept has been defined in dozen of ways. Since one organization's model of an MIS is likely to differ from that of another, its not surprising that their MIS definitions would also vary in scope and breadth. For our purpose, an MIS can be defined as a network of computer based data processing procedures developed in an organization and integrated as necessary with manual and other procedures for purpose of providing timely and effective information to support decision making and other necessary management functions.

Although MIS models differ, most of them recognize the concepts shown in Figure 3-1. in addition to what might be termed the horizontal management structure shown in Figure 3-3a, an organization is also divided vertically into different specialties and functions which require separate information flows (see Figure 3-3b). combining the horizontal managerial levels with vertical specialties produces the complex organizational structure shown in Figure 3-3c.

needed to support decision making (see Figure 3-2). Generally speaking, much of different responsibilities is obtained from the collection of existing information systems (or subsystems). These systems may be tied together very closely in an MIS.

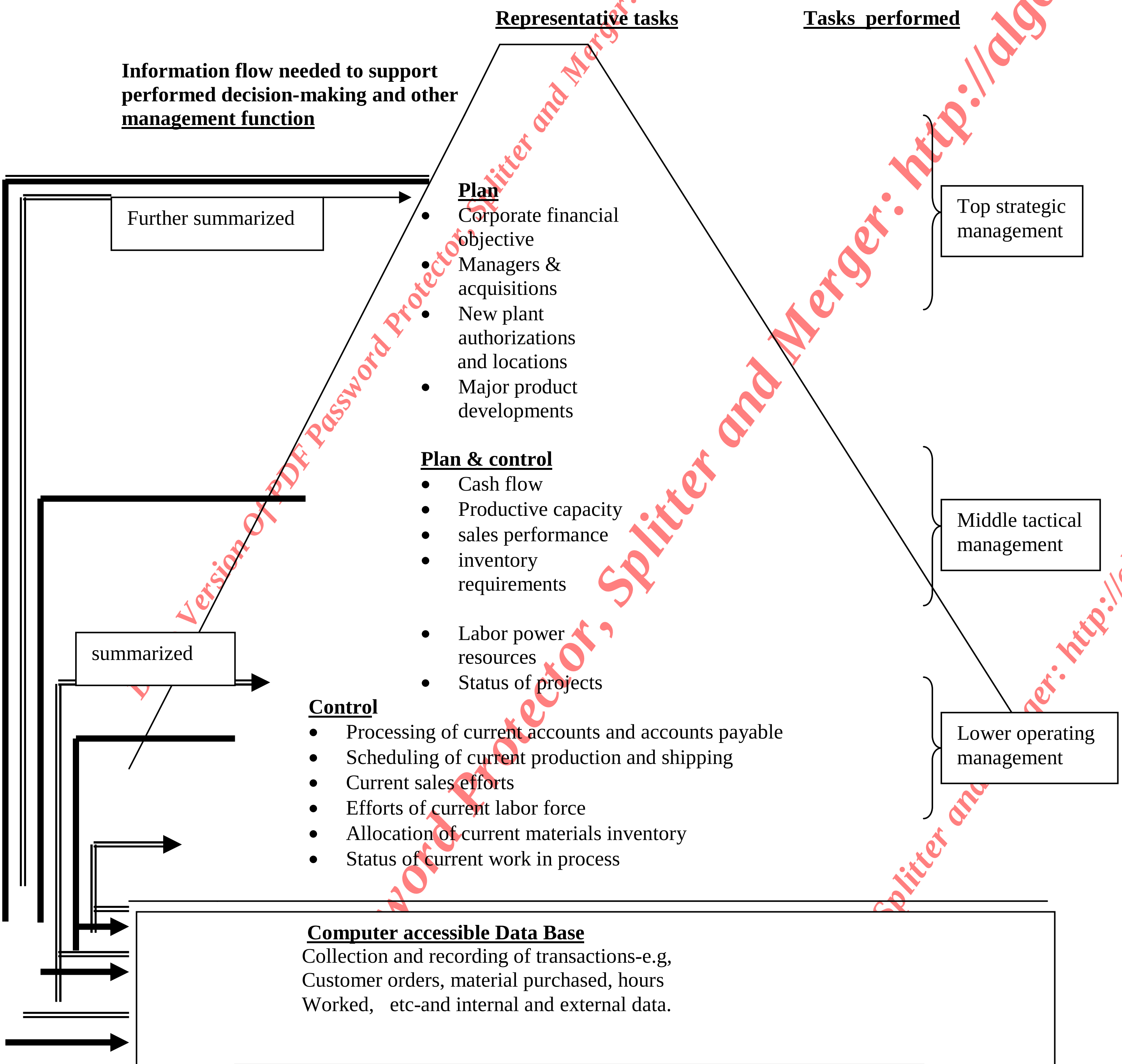


Figure 3-2. The task of MIS designers is to develop the information flow needed to support decision making.

Exercises

Group 8

Place a T or F in the space provided in the following true-false questions:

-----1. Managers at different level organizational levels needs the same kinds of the information since they do the same kind of planning.
-----2. Lower-level managers need information to support strategic planning.
-----3. Accuracy is the ratio of incorrect information to the total amount of information produced.
-----4. Regular reports should be prepared on hourly bases.
-----5. Traditional information system seem to have been designed on the assumption that lack of completeness is the most critical problem facing managers.
-----6. Numerous “total system” were designed in the late 1960s.
-----7. An MIS is a network of computer-based data processing procedures developed in organization and integrated as necessary to provide timely and effective information to support decision making.
-----8. In planning for an MIS, designers are in agreement that the “bottom-up” approach is best.
-----9. Most MISs today serve the needs of top-level managers and, to a lesser extent, the needs of operating managers.
-----10. An MIS can give managers more time to devote to planning.
-----11. Simulation models can be used to improve inventory planning.
-----12. An expert system is a payroll program written by an expert programmer.

Group 9

1. Why have traditional information system failed to meet the needs of managers ?.
2. A factor that complicates the subject of the information needed by managers is the organization level of the managerial job. Discuss this statement.
3. Identify and discuss the properties that management information should possess.
4. (a) what is an MIS ? (b) identify and discuss four issues involved in planning for an MIS.
5. How can an MIS affect the quality of a manager’s plans ?.
6. (a) what is simulation ? (b) How can it be used in planning and decision making ?.
7. (a) what is an expert system ? (b) identify and discuss one example of each system.
8. (a) What is an information center ? (b) what functions may be performed by such a center ?.

Exercises

Group 8

Place a T or F in the space provided in the following true-false questions:

-----1. Managers at different level organizational levels needs the same kinds of the information since they do the same kind of planning.
-----2. Lower-level managers need information to support strategic planning.
-----3. Accuracy is the ratio of incorrect information to the total amount of information produced.
-----4. Regular reports should be prepared on hourly bases.
-----5. Traditional information system seem to have been designed on the assumption that lack of completeness is the most critical problem facing managers.
-----6. Numerous "total system" were designed in the late 1960s.
-----7. An MIS is a network of computer-based data processing procedures developed in organization and integrated as necessary to provide timely and effective information to support decision making.
-----8. In planning for an MIS, designers are in agreement that the "bottom-up" approach is best.
-----9. Most MISs today serve the needs of top-level managers and, to a lesser extent, the needs of operating managers.
-----10. An MIS can give managers more time to devote to planning.
-----11. Simulation models can be used to improve inventory planning.
-----12. An expert system is a payroll program written by an expert programmer.

Group 9

1. Why have traditional information system failed to meet the needs of managers ?.
2. A factor that complicates the subject of the information needed by managers is the organization level of the managerial job. Discuss this statement.
3. Identify and discuss the properties that management information should possess.
4. (a) what is an MIS ? (b) identify and discuss four issues involved in planning for an MIS.
5. How can an MIS affect the quality of a manager's plans ?.
6. (a) what is simulation ? (b) How can it be used in planning and decision making ?.
7. (a) what is an expert system ? (b) identify and discuss one example of each system.
8. (a) What is an information center ? (b) what functions may be performed by such a center ?.

You may visit the following websites for more about the subject:
http://www.emadit.weebly..com
And
http://www.emadit.blogspot.com

Glossary:- The definitions of some important computer terms.

Access To locate desired data. See direct access, random access, remote access, serial access.

Access time The elapsed time between the instant when data are called for from a storage device and instant when the delivery operation is completed.

Accumulator a registrar or storage location that forms the result of an arithmetic or logic operation.

ACM Acronym for association for Computing Machinery, a Professional group dedicated to advancing the design, development, and application of information processing.

Acoustic coupler A type of modem which permits data communication over regular telephone lines by means of sound signals.

Acronym A word formed from the first letter(s) of the words contained in a phrase or name.

Ada A high-level programming language developed by the Department of Defense for use in military systems.

Address An identification (e.g., a label, name, number) that designate a particular location in storage or any other data destination or source.

ADP Automatic Data Processing.

ALGOL (**ALGO** Algorithmic Language) an algebraic, high-level language similar to **FORTRAN** that is widely used in Europe.

Algorithm A set well-defined rules for solving a problem in a finite number of operations.

Alphanumeric Pertaining to character set that includes letters, digits, and, usually, other special punctuation character marks.

Analog computer A device that operates on data in the form of continuously variable physical quantities.

Annotation symbol A symbol used

ANSI (American National Standards Institute). An organization that develops and approves standards in many fields.

APL (A Programming Language) A mathematically oriented high-level language frequently used in time sharing.

Application program Software designed for a specific purpose (such as account receivable, billing, or inventory control).

Architecture The organization and interconnection of computer system components.

Arithmetic-logic unit The part of a computing system containing the circuitry that does the adding, subtracting, multiplying, dividing, and comparing.

Artificial intelligence (**AI**) computer science branch that's involved with using computers to solve problem that appear to require human imagination or intelligence.

ASCII (American National Standard Code for Information Interchange). A standard code used to exchange information among data processing and communication systems.

Assembler program A computer program that takes non-machine language usage instructions prepared by a programmer and converts them into a form that be used by the computer.

Assembly language A means of communication with a computer at a low level. This language lies between high level languages (such as **BASIC**) and Machine language.

COBOL and machine language (1s and 0s the computer understands).

Automated office A general term that refers to the merger of computer, office electronic devices, and telecommunication technology in an office environment.

Auxiliary storage A storage that supplements the primary internal storage of a computer. Often referred to as secondary storage.

Back-end processor A computer that serves as interface between a larger CPU and data bases stored on direct-access storage device.

Background processing The automatic execution of lower-priority (back-ground) computer programs during periods when the system resources are not required to process higher-priority (foreground) programs.

Backup Alternate programs or equipment used in case the original incapacitated.

Bank switched memory The use of software –controlled switches that allow a central processor to switch between memory locations in primary and supplementary memory banks so that the apparent size of primary storage is increased.

BASIC (Beginner All-Purpose Symbolic Instruction Code). A high-level interactive programming language frequently used with personal computers and in timesharing environments.

Batch processing A technique in which a number of similar items or transactions or Jobs to be processed are grouped (batched) and processed in a designated sequence during a machine run.
Often referred to as sequential processing.

Baud A unit for measuring data transmission speed.

BCD (**Binary - Coded Decimal**) A method of representing the decimal digits zero through nine by a pattern of binary ones and zeros (e.g., the decimal number 25 is represented by 0010 0 101 in 8-4-2-1 **BCD** notation).

Binary digit Either of characters 0 or 1. Abbreviated "bit."

Binary number system A number system with a base or radix of two.

Bit See binary digit

Block Related records, characters, or digits that are grouped and handled as a unit during input and output. A sect ion of program coding treated as a units.

Branch An instruction that transfers program control to one or more possible paths.

Broadband channel communications channel such as those made possible by the use of laser beams and micro wave that can transmit data at high speed.

Buffer A storage device used to compensate for the difference in rates of flow of data from one device to another -e.g., from an **I/O** device to the Memory then the **CPU.**

Bug An error in a system or program.

Bus Circuits that provide a communication path between two or more dev- ices, such as between **CPU**, storage, and peripherals.

Byte a group of adjacent bits, usually eight, operated on as a unit.

Cache A very high speed storage device.

CAD/CAM (Computer-Aided Design/ Computer - Aided) Manufacturing). A general term applied to the efforts being made to automate design and manufacturing operations.

CAI (computer-Assisted Instruction) A general term that refers to a learning situation in which the student interacts with (and is guided by) a computer through a course of study aimed at achieving certain instruction.

Call A transfer of program control to a subroutine.

Canned program programs prepared by an outside and provided to a user in a machine-readable form.

Cathode ray tub (**CRT**) An electronic tub with a screen upon which information may be displayed.

Central Processing Unit (**CPU**) The component of a computer system with circuitry to control the interpretation and execution of instructions. The **CPU** includes primary storage, arithmetic -logic, and control sections.

Channel (1) A path for carrying signals between a source and a destination. **(2)** A track on a magnetic tape or a band on a magnetic drum.

Character string A string of alpha-numeric characters.

Chip A thin wafer of silicon on which integrated electronic components are deposited.

Clock A device that generates the periodic signals used to control the timing of all **CPU** operations.

COBOL A high-level language dev-eloped for business data processing applications.

Code A set of rules outlining the way in which data may be represented; also, rules used to convert data from one representation to another. To write a program or routine.

Collate To combine items from two or more sequences files into a single one.

COM (**Computer Output Machine**) A technology that permits the output information produced by computers to be stored on microfilm.

Common carrier A government-regulated organization that provide public communications services.

Communications channel A medium for transferring data from one location to an other.

Compiler A computer program that produces a machine-language program from a source program that's usually written in high - level language by a programmer. The compiler is capable of replacing single source program statements with a series of machine-language instructions or with a subroutine.

Computer An electronic symbol manipulation system that's designed and organized to automatically accept and store input data, process them, and produce output results under the direction of a detailed step-by step stored program of instructions.

Computer network A processing complex consisting of two or more interconnected computers.

Concentrator A communications device receives input from many low-speed lines and then concentrates and transmits a compressed and smooth stream of data on a higher- speed and more efficient transmission channel. Multiplexers also perform this function.

Conditional transfer An instruction that may cause a departure from the sequence of instruction being followed, depending upon result of an operation, the contents of a register, or the setting of an indicator.

Connector symbol Used in flow chart to represent a junction in a flow line, this symbol is often used to transfer flow between pages of lengthy chart.

Console The part of a computer system that enables human operators to communicate with computer.

Constant A value that doesn't change during program execution.

Control program Generally part of an operating system, this program help control the operations and management of computer system.

Control unit The section of the **CPU** that select, interprets, and sees to the execution of program instructions.

Counter A device (e.g., a register) used to represent the number of occurrences of an event.

CPU See central processing unit.

Crash A hardware or software failure that leads to abnormal cessation of processing.

Cursor A symbol on a visual display screen that highlights the location(s) to be affected by the next character or command that is entered.

Cybernetics The branch of learning which seeks to integrate the theories and studies of communication and control in machines and living organisms.

Cylinder All tracks on magnetic disks that are accessible by a single movement of the access mechanism.

DASD Acronym for Direct Access Storage Device.

Data Facts; the raw material of information.

Data bank See data base.

Data base A stored collection of the liberties of data that are needed by organization and individuals to meat their information processing and retrieval requirements.

Data base administrator The one responsible for defining, updating, and controlling access to a data base.

Data base management system (DBMS) The comprehensive software system that builds, maintain, and provides access to a data base.

Data entry operator One who transcribes data into a form suitable for computer processing.

Data processing one or more operations performed on data to achieve a desired objective.

Debug to detect, locate, and remove errors in programs and/or malfunction in equipments.

Decision support system (DSS) A computer-based system that backs up and assists those engaged in planning and decision-making activities.

Decision symbol This diamond shaped symbol is used in flowcharts to indicate a choice or branch in the processing path.

Decision table A programming analysis tool that shows all the conditions to be considered in a problem as well as the actions to be taken when given
Set of conditions is present.

Diagnostics Error message printed by a computer to indicate system problem and improper program instructions.

Digital computer A device that manipulates discrete data and performs arithmetic and logic operations on these data.

Digital PBX A private branch exchange that may be used automatically manage thousands of communications lines without human assistance. Both voice and data transmissions can be handled simultaneously over telephone lines, and no modems are need for local data exchange.

Direct access Pertaining to storage devices where the time required to retrieve data is independent of the physical location of the data.

Disk A revolving platter upon which data and programs are stored.

Disk pack A removable direct-access storage medium containing multiple magnetic disk mounted vertically on a single shaft.

Diskette A floppy disk. A low-cost magnetic medium used for I/O and secondary storage purposes.

Distributed data processing (DDP) A general term describing the process-ins of a logically related set of information processing functions through the use of multiple, geographically separated, computing and communications devices.

Documentation The preparation of documents, during system analysis and subsequent programming, that describe such things as the system, the programs prepared, and the changes made at late dates.

DOUNHILE, loop structure A control structure in which one or more operations in a loop are repeated until a condition is found to be true, after which the exit path out of the loop is followed.

Downtime The length of time a computer system is inoperative due to mal-functions.

EBCDIC (Extended Binary - coded Decimal Interchange Code) An 8-bit code used to represent data in modern computers.

Edit To correct, rearrange, and validate input data. To modify the form of output information by inserting blank spaces, special characters where needed, etc.

Editor A program used to interactively review and alter text materials and other program instructions.

EDP Acronym for Electronic Data Processing.

EEPROM An electrically erasable and programmable read-only memory chips that can be reprogrammed with special electrical pulses.

Electronic funds transfer (EFT) A general term referring to a cashless approach used to pay for goods and services. Electronic signals between computers are often used to adjust the accounts of the parties involved in transaction.

Electronic mail A general term to describe the transmission of messages by the use of computing systems and telecommunications facilities.

Electronic spreadsheet program A software package that permits users to quickly create, manipulate, and analyze in columns and rows.

Emulator A stored logic device or program that permits one computer to execute the machine-language instructions of another computer.

EPROM An erasable and programmable read-only memory chip that can be reprogrammed under limited conditions.

Executable routine A master program in operating system that control the execution of other programs. Often referred to as the executive, monitor, or supervisor.

Executive workstation Special desktop computer-based units designed for busy people who may not like to type. They have special function keys, and may accept input through the use of a mouse or touch screen. They have ability to perform word/data process- sing, mange date bases, produce graphics, and support many other activities

Expert system A software package that includes (1) a stored base of knowledge in a specialized area, and (2) the capability to probe this know ledge base and make decision recommendations. Expert systems are the products of research in the field of artificial intelligence.

Facsimile system A system used to transmit pictures, text, maps, etc., between geographically separated points. An image is scanned at a transmitting point and duplicated at a receiving point

Fiber - optic cable A data transmission medium made of tiny thread of glass or plastic that is able to transmit huge amounts of information at the speed of light.

Field A group of related characters treated as a unit, e.g., a group of adjacent card columns used to represent an hourly wage rate.

File A collection of related records treated as a unit.

File processing The updating of master files to reflect the effects of current transactions.

Floppy disk See diskette.

Flowchart A diagram that uses symbols and interconnecting lines to show (1) a system of processing to achieve objectives (system flowchart), or (2) the logic and sequence of specific program operations (program flowchart).

FORTRAN (**FOR**mula **TRAN**slator) A high-level programming language used to perform mathematical computations.

Front-end processor A **CPU** programmed to function as an interface between a larger **CPU** and assorted peripheral devices.

Full-duplex transmission The simultaneous sending and receiving of data over a communications path.

Generator A computer program that constructs other programs to perform a particular type of operation, etc., a report program generator.

Graphic display A visual device that is used to project graphic images.

Half-duplex transmission The sending and then receiving of data over a communications path during alternating periods of time. Data may be sent in both direction at the same time.

Hard copy Printed or filmed output in humanly readable form.

Hardware Physical equipment such as electronic, magnetic and mechanical devices. Contrast with software.

Heuristic A problem-solving method in which solution are discovered by evaluating the progress made toward the end result. A directed trial-end error approach. Contrast with algorithm.

Hierarchical data structure A logical approach to structuring data in which a single root data component or parent may have subordinate element or children, each of which, in turn, may own one or more other elements (or non). Each element or branch below the parent has only a single owner.

High level language A programming language oriented toward the problem to be solved or the procedures to be used. Instructions are given to a computer by using convenient letters, symbols, or English-like text, rather than by using the 1st and 0s code that the computer understands.

HIPO chart (Hierarchy plus-process output charts) Charts used in the analysis, design, and programming of computer applications.

Hollerith Code A particular type of code used to represent alphanumeric data on 80-column punched cards.

Host computer A main control computer in a network of distributed processors and terminals.

Hybrid computer A data processing device using both analog and discrete data representation.

IF-THEN-ELSE selection structure A basic program control structure that requires a test for some condition

followed by two alternative program paths. The path selected depends on the results of the test.

Indexed sequential access method See **ISAM**.

Information Meaning assigned data humans.

Information retrieval The methods used to recover specific information from stored data.

Input/output symbol A figure in the shape of parallelogram that's used to indicate both input and output operations in a flowchart.

Instruction A set of characters used to fit direct a data processing system in the performance of an operation, i.e., an operation is signaled and the values or locations of the instruction operands are supplied.

Integrated software package A software product that combines several applications, e.g., word processing, spreadsheet operations, the creation of graphs into a single package so that it's possible to share data and move material among these functions.

Intelligent terminal A terminal with a built-in CPU can be programmed to perform specific functions such as editing data, controlling other terminals, etc.

Interactive system One that permits direct communication and dialog between system users and the operating program in the CPU.

Interface A shared boundary, e.g., the boundary between two systems or devices.

Internal storage The addressable storage in a digital computer directly under the control of the CPU.

Interpreter A computer program that translates each source language statement into a sequence of machine instructions and then executes these machine instructions before trans lating the next source language statement. A device that prints on a punched card the data already punched in the card.

I/O See input/output.

ISAM (**Indexed Sequential Access Method**) A method whereby records organized in a sequential order can be referenced directly through the use of an index based on some key or characteristic.

Item A group of related characters treated as a unit. (A record is a group of related items, and file is a group of related records).

Job A collection of specific tasks constituting a unit of work for a computer.

Job-control language (**JCL**) A language that permits communication between programmers and an operating system . a job-control program written in this language can be translated into requests for action that can be executed by the computer.

Jump A departure from sequence in executing instructions in a computer. See conditional transfer.

K An abbreviation for a value equal to 2^{10} or 1024.

Key A unique item that's used to identify a record.

Label One or more characters used to identify a program statement or a data item.

Language A set of rules and conventions used to convey information.

Library routine A tested routine maintained in a library of programs.

Light pen An electrical device that permits people to provide input to computers by writing or sketching on the screen of cathode ray tube.

Local area network (**LAN**) A privately owned communications system that links computers, terminals, word processing stations, and other devices located within a compact area such as an office building or a campus.

Logic diagram See flowchart.

LSI (**Large Scale Integration**) The process of integrating a large number of electronic circuits on a single small chip of silicon or other material.

Machine language A language used directly by a computer.

Macro instruction A source language instruction that's equivalent to a specified number of machine-language instructions.

Magnetic ink character recognition (MICR) The recognition of character printed with special magnetic ink by machines.

Magnetic storage Utilizing the magnetic properties of materials to store data on such devices and media as disks, drums, cards, core, tapes, chips, and films.

Main control module The highest level in hierarchy by program modules. This module controls others below it.

Mainframe A large computer system that has the capability to support many powerful peripheral devices.

Maintenance programming The act of changing and modifying existing programs to meet changing conditions.

Management information system (MIS) A computer-based information system designed to apply organizational managers with necessary information needed to plan, organize, staff, direct, and control the operations of the organization.

Master file A file containing relatively permanent data. This file is often updated by records in a translation file.

Memory Same as storage.

Menu A set of programmed choices provided to a computer users.

Message switcher A communication processor that receives messages and forwards them to appropriate locations

Microcomputer The smallest category of computer, consisting of microprocessor and associated storage and input/output elements.

Microfiche A sheet of film (usually 4 by 6 inches) that may be used to record the results of computer processing.

Microprocessor The basic arithmetic, logic, and storage elements required for processing.

Micro-program a sequence of elementary instructions that is translated by micro-logic subsystem residing in the CPU.

Microsecond one-millionth of a second.

Micro-to-mainframe linkage A hardware/software product that permits communication between a mainframe system and the personal computer systems located on the desk of users.

Millisecond One-thousandth of a second.

Minicomputer a relatively fast but small and inexpensive computer with somewhat limited input/output capabilities

Mnemonic pertaining to a technique used to aid human memory.

Modem A device that modulates and demodulates signals transmitted over voice grade communication facilities.

Modular approach Dividing a project into segments and smaller units in order to simplify analysis, design, and programming efforts.

Monitor routine See executive routine.

Mouse An input device about the size of a tape cassette that rolls on a small bearing and has one or more buttons on the top. when rolled across a flat surface, the mouse guides on a visual display screen in the direction of the mouse's movement.

Multiplex To simultaneously transmit messages over a single channel or other communications facility.

Multiplexer A communications device that receive messages from low-speed lines and then sends these messages along a single high-speed transmission channel. Concentrators also perform this function.

Multiprocessor A computer network consisting of two or more central processors under a common control

Multiprogramming The simultaneous handling of multiple independent programs of interleaving or overlapping their execution.

Nanosecond One-billionth of a second.

Narrow bandwidth channels Communications channels that can be only transmit data at slow speeds, e.g., telegraph channels.

Natural language A human language such as English, French, German, etc.

Network An interconnection of computer systems and/or peripheral devices at dispersed locations that exchange data as necessary to perform the functions of the network.

Network data structure A logical approach to structuring data that permits network nodes to be connected in multidirectional manners. Each node may have several owners and may, in turn, own any number of other data units.

Node An end point of a branch in a network, or a common junction of two or more network branches.

Nonvolatile storage A storage medium that retains its contents in the absence of power.

Object language The output of a translation process. Contrast with source language.

OCR (Optical Character Recognition) The recognition of printed characters through the use of light-sensitive optical machines.

Octal Pertaining to a number system with base of eight.

Offline A term describing persons, equipment, or devices not in direct communication with the CPU.

Off-page connector symbol A flow-chart symbol used to show that program flow is entering from or going to a separate flowchart page.

Online A term describing persons, equipment, or devices in direct communication with the CPU.

Operand The data unit or equipment item that's operated upon. An operand is usually identified by an address in an instruction

Operating system An organized collection of software that controls the overall operations of a computer.

Operation code The instruction code used to specify the operations a computer to perform.

Overlapped processing An approach that permits the computer to work on several programs instead of one.

Parallel interface An electrical interconnection that permits 8 or more bits of data to be moved in the same instant in time. Contrast with serial interface.

Parity check A method of checking the accuracy of binary data after those data have been transferred to or from storage. The number of 1 bits in a binary character is controlled by the addition or deletion of a parity bit.

Pascal A popular high-level programming language that facilitates the use of structured programming techniques.

Patch The modification of a program in an expedient way.

Peripherals The input/output devices and auxiliary storage units of a computer system.

Personal computer (pc) A single-user-oriented and general-purpose microcomputer processing system that can execute program instructions to perform a wide variety of tasks.

Pico-second One thousandth of a nanosecond.

Pixel A picture element on the screen of a visual display used for graphics work that is controlled by the contents of a specific location in storage. By turning each pixel on or off, the CPU is able to paint a graphic image.

PL/1 (Programming Language) A high-level language designed to process both scientific and file processing applications.

Plotter A device that converts computer output into graphic, hard-copy form.

Pointer A data form item in one record that contained the location address of another logically related record.

Point-of-scale (POS) terminal An I/O device capable of (1) immediately updating sales and inventory records at a central CPU, and (2) producing a printed sales transaction receipt.

Port An electrical interconnection.

Preparation symbol A flowchart symbol to indicate the control, initiation, or performance of some other operation on the program itself.

Primary storage section Also known as internal storage and main memory, this section of the CPU holds program instructions, input data, intermediate results, and the output information produced during processing.

Printer A device used to produce humanly readable computer output. A wide range of impact and non-impact printers is currently available.

Processing symbol A rectangular figure used in flow charts to indicates a processing operation, etc., calculation.

Program (1) A plan to achieve a problem solution; (2) to design, write, and test one or more routines; (3) a set of sequenced instructions to cause a computer to perform particular operations.

Program library A collection of programs and routines.

Programmer One who designs, writes, tests, and maintain computer programs.

Programming Language A language used to express programs.

PROM (Programmable Read-only Memory) A read-only storage device that can be programmed after manufactured by external equipment. PROMs are usually integrated circuit chips.

Pseudo code A programming analysis tool. Counterfeit and abbreviated versions of actual computer instructions that are written in ordinary natural language.

Radix The base number in a number system, e.g., the radix in the decimal system is 10. synonymous.

RAM (Random Access Memory) A storage device structured so that the time required to retrieve data is not significantly affected by the physical location of the data.

Real time Descriptive of online computer processing systems which receive and process data quickly enough to produce output to control, direct, or affect the outcome of an ongoing activity or process.

Record A collection of related items of data treated as a unit.

Register A device capable of storing a specific amount of data.

Relational An approach to structuring data in such a way that the logical relationships are presented in interrelated tables.

Relational symbol Symbols such as (>, <, or =) that are used to compare two values in a conditional branching situation.

Remote access Relating to the communication with computer facility by a situation (or stations) that is distant from the computer.

Robotics The study of the technology of programmable manipulators that are designed to move materials, parts, tools, or other specialized devices through a series of programmed steps.

ROM (Read-Only Memory) Generally a solid-state storage chip that's programmed at the time of its manufacture and may not be reprogrammed by computer users.

Routine An ordered set of general use instructions.

RUN TIME The time required to complete a single, continuous execution of an object program.

Scratchpad storage A memory space used for the temporary storage of data. Typically, scratchpad memories high-speed integrated circuits.

Semiconductor storage A memory device whose storage elements are formed as solid state electronic components on an integrated circuit chip.

Sequential processing See batch processing.

Serial access Descriptive of a storage device or medium where there is a sequential relationship between access time and the data location in storage, i.e., the access time is dependent upon the location of the data. Contrast with direct-access and random access.

Serial interface An electrical interconnection that permits to be moved one bit at a time over a single path. Contrast with parallel interface.

Simplex transmission The movement of data along a path that permits communication in only one predetermined direction.

Simulation To represent and analyze properties or behavior of a physical or hypothetical system by the behavior of system model. T his model is often manipulated by means of computer operations.

Software A set of programs, documents, procedures, and routines associated with the operation of a computer system. Contrast with hardware.

Solid-state Descriptive of electronic components whose operation depends on the control of electric or magnetic phenomena in solids, such as transistors and diodes.

Sort To arrange data into a predetermined sequence.

Source language The language that is an input for statement translation.

Source program A computer program written in a source language such as **BASIC, FORTRAN, COBOL**, etc.

Spooler program Software that allows the CPU to alternate between processing a user's ongoing activity and controlling another activity such as printing.

Spreadsheet program See electronic spreadsheet program.

Statement In programming an expression or generalized instruction in a source language.

Storage Descriptive of a device or medium that can accept data, hold them, and deliver them on demand at a later time. Synonymous with memory.

Structured programming An approach or discipline used in designed and coding of computer program. The approach generally assumes the disciplined use of a few basic coding structures and the use of top-down concepts to decompose main functions into lower-level components for modular coding purposes.

Supercomputer Computer systems characterized by their large size and very high processed speeds. Generally used for complex scientific application.

Supervisor See executive routine.

System (1) A grouping of integrated methods and procedures united to form an organized entity, (2) an organized grouping of people, methods, machines, and materials collected together to accomplish a set of specific objectives.

System analysis A detailed step-by-step investigation of related procedures to see what must be done and the best way of doing it.

System analyst One who studies the activities, methods, procedures, and techniques of organizational systems in order to determine what actions need to be taken and how these actions can best be accomplished.

System commands The means by which programmers communicate with the operating system of the computer.

System design The creation of alternative solutions to the problems uncovered in system analysis. The final design recommendation is based on cost effectiveness and other factors.

Systems programming The development and maintenance of operating system software.

Telecommunication Transmission of data between computer systems and/or terminals in different locations.

Telecommuting Substituting work performed on computer-based work-stations and telecommunications networks in homes and neighborhood work centers for tasks performed in central office locations.

Teleconferencing The electronic linking of geographically scattered people who are all participating at the same time.

Terminal A device that perform I/O operations in a computer system

Terminal symbol An oval-shaped figure used in a flowchart to indicate starting and termination points.

Throughout The total amount of useful work performed by a computer system during a given time period.

Timesharing The use of specific hardware by a number of other devices, programs, or people simultaneously in such a way as to provide a quick response to each of the users.

Top-down methodology A disciplined approach to organizing complexity by identifying the top-level functions in a system and then decomposing these functions into a hierarchy of understandable lower-level modules.

Unconditional transfer An instruction that always causes a branch in program control from the normal sequence of executing instructions.

UPC (Universal Product Code) A machine-readable code of parallel bars used for labeling products found in supermarkets.

User-friendly software A phrase that presumably describes a program or system that people with limited computing backgrounds will find easy to learn and/or use.

Utility routine Software used to perform some frequently required process in the operation of a computer system, e.g., sorting, merging, etc.

Value added network (VAN) A communications network operated by an organization that leases the facilities of a common carrier and then offers additional services to its customers.

Videotext systems A general term used to describe personal computing/communications networks that permit interaction between people and stored data bases.

Virtual storage Descriptive of the capability to use online secondary storage devices and specialized software to divide programs into smaller segments for transmission to and from internal storage in order to significantly increase the effective size of the variable internal storage.

Visual display terminal A device capable of displaying keyed input and CPU output on a cathode ray tube.

VLSI (Very Large Scale Integration) The packing of hundreds of thousands of electronic components on a single semiconductor chips.

Voice-grade channels Medium-speed data transmission channels that use telephone communications facilities.

Volatile storage A storage medium that loses its contents in the event of a power interruption.

Von Neumann bottleneck A reference to the fact that processing speed in a von Neumann machine is limited by the speed of (1) the circuits in the single channel used to carry instructions from primary storage to the control section, and (2) the circuits in the single data path between primary storage and the arithmetic-logic section.

Von Neumann machine A computer system whose CPU has a single control, primary storage, and arithmetic-logic section. Such machine follows the design approach developed by John Von Neumann and others in the mid-1940s.

Winchester technology The name given to those types of rigid magnetic disk storage systems that are permanently housed (along with their access arms and read/write heads) in sealed, contamination-free containers. Winchester disk systems come in many sizes and storage capacities.

Window A portion of the visual display screen used to show the current status of an application of interest. The display screen can be separated into several windows to simultaneously show the status of the different application in an integrated software package.

Word A group of bits or characters considered as an entity and capable of being stored in one storage location.

Word length The number of characters or bits in a word.

Word processing The use of computers to create, view, edit, store, retrieve, and print text material.

Zone bits Used in different combinations with numeric to represent alphanumeric characters.

GLOSSARY-Dictionary

A

- Abacus حاسبة خرز
- Access الوصول لمواقع البيانات
- Accumulator مجمع (مركّم)
- Accuracy الدقة
- Acronym إختصار بالأحرف الآلي
- ADA language لغة آدا
- Address عنوان
- Alphabetic coding الترميز الألفبائي
- Array مظومة ، نسق (مصفوفة)
- Arithmetic/Logic Unit وحدة الحساب و المنطق
- Artificial Intelligence ذكاء اصطناعي
- Ascending تصاعدي
- Assembler برنامج ترجمة لغة التجميع
- Assembly program برنامج التجميع
- Audio response استجابة سمعية
- Auxiliary memory ذاكرة مساعدة
- Auxiliary storage جهاز تخزين مساعد

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Demo Version Of PDF Password Protector, Splitter and Merger: http://algologic.in

B

- Basic language لغة البيسك
- Binary code نظام ترميز ثنائي القيمة
- Binary digit مرتبة لعدد ثنائي
- Bit رقم ثنائي العدد
- Bit per inch وحدات المعلومات /انج
- Bit per second وحدات المعلومات المرسلة في ثانية واحدة
- Blank فسحة ، فراغ
- Block كتلة معلومات أو إيعازات
- Bold عريض
- Boolean algebra علم الجبر البوليني
- Branch فرع
- Browse يتصفح
- Break إنهاء أو إيقاف
- Bubble memories ذاكرات فقاعية
- Buffer التخزين المؤقت للمعلومات
- Bus ناقل البيانات
- Byte بايت : مجموعة من ثمانية أرقام ثنائية

C

- Cache مخبأة

- ❖ Calculator آلة حاسبة
- ❖ Central Processing Unit
  وحدة المعالجة المركزية
- ❖ Chain سلسلة
- ❖ Channel
  قناة
- ❖ Character رمز (محرف)
- ❖ Check فحص
- ❖ Check bit مرتبة الفحص
- ❖ Chip شريحة(رقاقة)
- ❖ C-language
  لغةسي
- ❖ Clear يزيل أو يمسح
- ❖ Close… إغلاق
- ❖ Command… أمر
- ❖ Comment تعليق ، ملاحظة
  تفسيرية
- ❖ Compiler برنامج يترجم لغة
  برمجة عالية المستوى مثل لغة
  باسكال إلى لغة الماكنة
- ❖ Computer code ترميز
  الحاسوب
- ❖ Computer programming
  برمجة الحاسوب
- ❖ Connector موصل
- ❖ Constant قيمة ثابتة
- ❖ Control سيطرة

- ❖ Control unit وحدة السيطرة
- ❖ Controller جهاز التحكم
- ❖ Copy استنساخ
- ❖ Counter عداد
- ❖ Crash عطل مفاجئ
- ❖ Cut يقطع ، يقص
- ❖ Cylinder مناطق متوازية من اسطوانات القرص الصلب المتع

D

- ❖ Data بيانات
- ❖ Data base قاعدة بيانات
- ❖ Data communication قنوات اتصال البيانات
- ❖ Data field حقل تخزين البيانات
- ❖ Data files ملفات البيانات
- ❖ Data flowchart مخطط انسياب البيانات
- ❖ Data processing علم أو تقنية معالجة البيانات بالحاسوب
- ❖ Data processor معالج البيانات
- ❖ Data retrieval استرجاع البيانات
- ❖ Dead time الفترة الزمنية بين انتهاء عمل وبدء عمل أخر
- ❖ Dead Lock حالة التوقف (القفل الميت)

- Dedicated تكريس أو تخصص
- Delete
يحذف
- Design يصمم
- Digit مرتبة رقمية
- Dimension بُعد
- Direct access وصول مباشر
- Directory دليل
- Disk قرص
- Disk pack قرص متعدد الطبقات
- Disk storage خزن
المعلومات مغناطيسيا على قرص
- Drum واسطة تخزين ثانوية
على شكل اسطوانة
- Dummy instruction إيعاز
زائف
- Dynamic storage ذاكرة
تخزين فعالة

E

- Edit command أمر تحرير
- Eject يخرج القرص
- Elapsed time الزمن
المستغرق لتنفيذ عملية معينة
- Error message رسالة خطأ
- Escape يترك برنامجاً

- Execution تنفيذ
- Exit خروج
- Expert خبير
- Expert Systems الأنظمة الخبيرة
- External storage وسائط تخزين خارجية

F

- Feed آلية تغذية
- Feed back التغذية المرتدة
- File ملف
- File label بطاقة الملف

- File updating تحديث ملف
- Find يبحث
- Floppy disk قرص مرن لتخزين المعلومات
- Flowchart مخطط انسيابي
- Folder مجلد
- Font نوع الخط
- Format تنسيق ، تهيأة
- Fortran language لغة الفورتران
- Frame إطار
- Frequency تردد، ذبذبة، تكرار

- Function وظيفة ، دالة

G

- Gap فجوة : انقطاع في سيل المعلومات
- Gap length طول الفجوة
- Gateway حاسبة تجهز اتصال بين شبكتين
- General purpose computer حاسوب للاستعمالات العامة
- Graphic display عارضة رسومية

H

- Hacker شخص يستخدم موهبته للحصول على دخول غير مشروع للحاسبة
- Hard disk القرص الصلب
- Hardware الكيان المادي
- Header رأس الصفحة
- Help تعليمات تساعد على فهم تنفيذ البرنامج
- Hertz وحدة الذبذبة
- Hexadecimal نظام عددي يستند على 16 رقم (النظام السادس عشري)
- High level language لغة برمجة ذات مستوى عالي

❖ Home computer
حاسوب منزلي صغير

❖ Host حاسبة مضيفة على الشبكة
التي تسمح لعدد من المستخدمين
للدخول إليها

❖ Hybrid computer حاسوب
هجين

❖ Hypertext نصوص مكتنزة (لا
تقتصر على النصوص فقط بل
الصور، تشمل أيضاً
الأصوات، الفيديو ...

❖ I/O المدخلات والمخرجات
الحاسوب

❖ I/O control system نظام
التحكم على مدخلات ومخرجات
الحاسوب

❖ Identification تعريف

❖ Identifier معّرف (أسماء
متغيرات، ثوابت، الخ ....)

❖ Idle time الفترة التي تمر بدون
أن يعمل الحاسوب

❖ Illegal instruction إيعاز
غير قانوني

❖ Image صورة

❖ Image Proceeing معالجة
الصور

❖ Implementation تنفيذ و
تطبيق البرنامج

❖ Inclusion تضمين

❖ Index فهرس أو لائحة

❖ Index value قيمة مفهرسة

❖ Information retrieval
استرجاع المعلومات

❖ Information system نظام
مناولة المعلومات

❖ Inhibit منع

❖ Initialization الشروع بالتنفيذ
أو البدء

❖ In-line subroutine
برنامج فرعي ضمن التتابع
الرئيسي

❖ Input المدخلات

❖ Input device جهاز المدخلات

❖ Input mode طور الإدخال

❖ Input terminal محطة طرفية
للإدخال

❖ Input/output channel قناة
توصيل المدخلات والمخرجات

❖ Inquiry استعلام أو استفسار

❖ Instruction إيعاز

❖ Integer عدد صحيح

❖ Integer variable متغير عدد
صحيح

❖ Integrated circuit دائرة
متكاملة

❖ Integrated data processing
معالجة متكاملة للمعطيات

❖ Intelligence ذكاء

❖ Inter-block gap فسحة
فراغ على شريط ممغنط

- Internal memory ذاكرة داخلية
- Interpret تفسير
- Interpreter مترجم مفسر
- Inter-record gap فسحة فراغ بين سجلين
- Interrupt مقاطعة
- Italic حروف مائلة

J

- Job وظيفة أو وحدة عمل
- Jump التجاوز : التحكم بالنقل
- Justification ضبط وتصفيف الحقول

K

- Key مفتاح ترميز بنود المعلومات
- Keyboard لوحة المفاتيح
- Keyword كلمة مفتاحية

L

- Label علامة، مجموعة رموز تعريف
- Language assembler نظام تجميع رموز وتحويلها إلى خرج رقمي ثنائي
- Language interpreter برنامج مفسر لترجمة لغات برمجة مثل بيسك
- Layout تخطيط ترتيب المعطيات

❖ Letter حرف أبجدي

❖ Level مستوى

❖ Library مكتبة

❖ Light pen قلم ضوئي

❖ Light sensor جهاز تحسس بالضوء

❖ Line printer طابعة خطية : طابعة سريعة بإمكانها طبع خط كامل

❖ Link رابط أو وصلة

❖ Linkage عملية ربط مكونات البرنامج

❖ Load تحميل المعلومات إلى الحاسوب

❖ Location عنوان ، موقع

❖ Log off يغلق برنامج الحاسوب

❖ Log in الدخول إلى برنامج أو تطبيق

❖ Logic منطق

❖ Logical decision قرار منطقي

❖ Loop حلقة إيعازات تنفذ اكثر من مرة

M

❖ Magnetic tape شريط ممغنط : يستعمل لتسجيل المعطيات

❖ Magnitude مقدار ، قيمة

❖ Main frame الحاسوب الضخم

- ❖ Main storage التخزين الرئيسي للحاسوب
- ❖ Main memory الذاكرة الرئيسية للحاسوب
- ❖ Manual دليل استعمال
- ❖ Mark علامة
- ❖ Marker reader جهاز قراءة الإشارات المكتوبة
- ❖ Mass storage device وحدة تخزين ذات سعة كبيرة
- ❖ Master file الملف الرئيسي المرجعي للمعلومات
- ❖ Match مطابق ، مقارنة بين بندين
- ❖ Matrix مصفوفة
- ❖ Mean time between failure متوسط الزمن بين العطلات
- ❖ Mean time to failure متوسط الزمن لحدوث العطلات
- ❖ Memory الذاكرة الرئيسية للحاسوب
- ❖ Memory error خطأ في معطيات الذاكرة
- ❖ Menu قائمة خيارات
- ❖ Message رسالة: مجموعة من الإشارات لتبليغ المعلومات
- ❖ Micro جزء من المليون
- ❖ Micro-computer حاسوب دقيق

❖ Microfilm ميكروفيلم: فلم مصغر لتسجيل الصور

❖ Micron ميكرون : جزء من المليون من المتر

❖ Micro-processing unit الوحدة الأساسية للحاسوب الدقيق

❖ Microprocessor المعالج الدقيق

❖ Micro-processor chip شريحة الحاسوب الدقيق

❖ Mini-computer حاسوب صغير

❖ Mini-diskette قرص ممغط صغير

❖ Mode أسلوبطور ، نمط

❖ Model طراز ، نموذج

❖ Monitoring عملية مراقبة التشغيل

❖ Move نقل من موقع ذاكرة إلى آخر

❖ Multi-plexer جهاز الإرسال المتعدد

❖ Multiprogramming البرمجة المتعددة

N

❖ Nanosecond واحد من مليار من الثانية

❖ Network شبكة (معلومات)

❖ New جديد

❖ New record سجل أو بند جديد

❖ Notebook computer حاسوب محمول يزن حوالي خمسة

كيلو و مجهز بقوة كهربائية ذاتية

O

- Octal نظام ترقيم يستخدم القيم 8 كأساس
- Omit يحذف
- On-line يخضع للتحكم المباشر للحاسوب
- Open يفتح
- Operand معامل العملية الحسابية
- Operating system نظام التشغيل
- Operation manual دليل العمليات
- Operator مشغل الحاسوب

- Optical scanner جهاز مسح للإشارات الضوئية

O

- Options خيارات
- Output مخرج ، مخرجات
- Overflow تجاوز السعة
- Overload تجاوز التحميل

P

- Package software حزمة من البرامج الجاهزة

- Packet حزمة من البيانات أرسلت عبر الشبكة
- Page صفحة
- Pal Paper tape شريط ورق
- Paste يلصق مادة منقولة من مكان آخر
- Pentium معالج بسعة 64 بت
- Peripheral جهاز ملحق موصل بالحاسوب مثل الطابعة و غيرها
- Photocell خلية ضوئية
- Pixel اصغر عنصر للصورة
- Polarity القطبية
- Primary store مخزن المعلومات الرئيسي في الحاسوب
- Print يطبع
- Print setup مواصفات الطبع
- Printout الخرج الصادر من جهاز الطباعة
- Processor المعالج للمعطيات
- Program برنامج
- Program library مكتبة البرنامج
- Programming languages لغات البرمجة
- Protectable memory ذاكرة قابلة للوقاية

❖ Protocol مجموعة من القواعد المتفق عليها

Q

❖ Quasi-instruction إيعاز زائف

❖ Queue طابور

❖ Query طلب معلومات

❖ Quotient حاصل القسمة

R

❖ RAM ذاكرة خزن مباشر

❖ Random Access Memory ذاكرة الوصول العشوائي

❖ Raw data معطيات غير معالجة

❖ Read قراءة أو إدخال معطيات

❖ Reader جهاز حساس بالمعطيات

❖ Read-only اقرأ فقط

❖ Ready جاهز للتشغيل

❖ Real time الزمن الحقيقي

❖ Record سجل المعلومات

❖ Remote access اتصال بين منظومة الحاسبة و واحدة أو اكثر على بعد من محطة من الواقعة منظومة الحاسبة الفعلية

❖ Remote control جهاز التحكم عن بعد

❖ Reset إعادة الضبط

- Restart إعادة التشغيل
- Restore إعادة التخزين
- Retrieve استرجاع المعطيات
- Rewind إعادة لف
- Rewrite إعادة كتابة المعطيات
- Robot إنسان آلي
- ROM ذاكرة للقراءة فقط
- Routine برنامج لغة
- Run تنفيذ برنامج حاسوب

S

- Save يحفظ
- Scan عملية فحص أو مسح
- Screen unit وحدة للشاشة
- Scrolling انزلاق المعلومات على الشاشة
- Search يبحث
- Secondary memory ذاكرة ثانوية
- Segment مقطع
- Select يختار
- Selector جهاز انتقاء
- Semiconductor شبه موصل
- Sensor جهاز التحسس

- Sequence متتابعة
- Sequental
  تتابعي
- Serial تسلسل
- Server
  خادم للشبكة
- Set مجموعة
- Shift نقل المعطيات
- Show يعرض
- Sign إشارة
- Simplex إرسال في اتجاه واحد
- Software برمجيات الحاسوب
- Sort يصنف يرتب
- Source language لغة
  المصدر
- Source program برنامج
  المصدر
- Space مساحة أوفراغ
- Special character رمز
  خاص
- Speech synthesis تحويل
  الكلام الطبيعي إلى اصطناعي
- Spell checker تدقيق
  التهجئة
- Step عملية واحدة أو خطوة
- Stop bit وحدة معلومات تحدد
  نهاية كلمة
- Storage تخزين المعلومات

❖ Structural programming برمجة مهيكلة

❖ Sturdl لغة حلسوب تستعمل في تحليل وتصميم الانشات

❖ Subprogram جزء من برنامج

❖ Subroutine برنامج فرعي

❖ Subsystem نظام فرعي

❖ Supervisor روتين تنفيذي يتحكم بتشغيل الحاسوب

❖ Symbol رمز

❖ Symbolic language لغة برمجة تسمح بلستخدام الرموز

❖ Synchronous متزامن تزامني

❖ Syntax قواعد بناء الجمل

❖ System design تصميم الأنظمة

❖ System software برمجيات النظام

❖ System unit وحدة النظام

T

❖ Tabulation جدولة المعطيات

❖ Tape شريط ممغنط

❖ Teletypewriter الة كتابة تعمل بتوجيه عن بعد

❖ Term تعبير مصطلح

❖ Terminal محطة طرفية

- Thin film memory
  ممصنوعة من أقراص ذاكرة
  دقيقة للغاية
- Time-shaing المشاركة
  الزمنية
- Track المسار في القرص
- Translator مترجم
- Transfere يحول أو ينقل
- Transmission إرسال أو بث

U

- Underline يضع
  خطا تحت الكلمة أو العبارة
- Update تحديث

- Undo تراجع عن عملية ما
- Upload تحميل من حاسبة
  المستفيد إلى موقع الإنترنت
- Upper case حرف طباعي
  كبير
- Username لسم المستخدم

V

- Vacuum فراغ هوائي
- Variable متغير
- Video display
  عارضة صور فديوية
- View يستعرض

- Voice frequency تردد صوتي
- Voice output خرج الحاسوب على شكل صوت الإنسان
- Voice recognition التعرف على الصوت
- Voice synthesis تركيب الصوت
- Voice synthesizer جهاز اصطناع صوت الإنسان
- Volatile متطاير
- Wait time زمن الانتظار
- Wave form شكل الموجة الكهرومغناطيسية
- Window نافذة
- Word كلمة
- Word length طول الكلمة
- Word-processing معالج النصوص
- Write الكتابة، إخراج المعلومات

ABBREVIATIONs

- ACK:-Acknowledgment
- ACU:-Automatic Call Unit

- ADLC:-Advanced Data Link Controller
- ADP:-Automatic Data Processing
- Algol:-Algorithmic language
- ALU:-Arithmetic/Logical Unit
- ANI:-Automatic Number Identification
- APL:-A programming Language
- ASR:-Automatic Send/Receive

B

- BAL:-Basic Assembler language
- BASIC:- Beginner All Purpose Symbolic Instruction Code
- BCD:-Binary Coded Decimal
- BDAM:-Basic Data Access Method
- BIT:-Binary digit
- BOT:-Beginning Of Tape
- BPI:-Bits Per Inch
- BPS:-Bits Per Second
- BS:-Back Space
- BSN:-Back-end Strage Network
- BUF:-Buffer

C

- CAD:-Computer Aided Design
- CAI:-Computer Aided Instruction

- CAN:-Cancel
- CBL:-Computer Based Learning
- CD:-Compact Disc
- CHKPT:-Checkpoint
- CLK:-Clock
- COBOL:-Common business Oriented language
- CPL:-Combined programming
- Language
- CPS:-Character per second
- CPU:-Central processing unit
- CR:-Carriage return
- CROM:-Control read only Memory
- CRT:-Cathode Ray Tube
- CTR:-Counter
- CTS:-Clear to send
- DAC:-Digital to analog Converter

D

- DASD:-Direct Access Storage Device
- DBMS:-Data Base Management System
- DC:-Device Control
- DCB:-Data Control Block
- DFC:-Data Flow Control
- DIL:-Dual in line
- DMA:-Direct Memory Access
- DML:-Data Manipulation Language
- DMS:-Data Management System

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- DOS:-Disk Operating System
- DPM:-Data Processing Manager

E

- EDP:-Electronic Data Processing
- EDPM:-Electronic Data Processing Machine
- EDS:-Exchangeable Disk Store
- EM:-End of Medium
- ENC:-Encoder
- ENQ:-Enquiry
- EOB:-End Of Block
- EOF:-End Of File
- EOJ:-End Of Job
- EOM:-End Of Message
- EOR:-End Of Record
- EOT:-End Of Transmission
- ESC:-Escape
- ETX:-End of text

F

- FAX:-Fascimile
- FDM:-Frequency division Multiplexing
- FIFO:-First in, first out
- FORTRAN:-Formula translator

G

- GE:-Greater than or equal
- GT:-Greater Than

H

- HT:-Horizontal tabulation

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- HZ:-Hertz

I

- IAL:-International Algebraic Language
- IC:-Integrated Circuit
- IDP:-Integrated Data Processing
- I/O:-Input/Output
- IOR:-Inclusive (or)
- IPS:-Inches Per Second

K

- K:-Kilo
- KB:-Kilobytes
- Kb:-Kilobits
- KSR:-Keyboard Send/Receive

L

- LC:-Lower case
- LE:-Less than or equal
- LEFO:-Last In First Out
- LPM:-Lines per minute
- LSI:-Large scale integration
- LE:-Less than

M

- M:-Mega (one million)
- MBD:-Magnatic bubble memory Device
- MCM:-Mont Carlo method
- MHZ:-Megahertz
- MIPS:-Million instruction per Second

- MIS:-Management information System
- MPU:-Microprocessor unit
- MS:-MicroSoft
- MT:-Magnetic Tape
- MTBF:-Mean Time Between Failure
- MTTP:-Mean Time To Failure

N

- NE:-Not Equal to
- NAND:-Not AND
- NOR:-Not OR
- NRZ:-Non Return to Zero
- NUL:-Null

O

- OCR:-Optical Character Recognition
- OMR:-Optical Mark Recognition

P

- PC:-Program counter
- PC:-Personal Computer
- PI:-Program Interrupt
- PT:-Paper Tape

R

- RAM:-Random Access Memory
- RO:-Read Only

- ROM:-Read Only Memory
- RTE:-Real Time Executive
- R/W:-Read/Write

S

- SLANG:-System language
- SOM:-Start of message
- SP:-Space
- SSI:-Small scale integration
- SUB:-Substitute

T

- TTY:-Teletype writer

U

- UC:-Upper Case
- UPS:- Uniterruptable Power Supply
- USB:- Universal System Bus

V

- VDU:-Visual Display Unit,

  Video Display Unit
- VISI:-Very Large Scale Integration
- VT:-Vertical Tabulation

X

- X-OFF:-Transmitter off
- X-ON:-Transmitter on
- XMT:-Transmit
- XOR:-Exclusive (OR)